March 2021

AR Usage & Consumer Attitudes, Wave IV

An ARtillery Intelligence Briefing

THRIVE ANALYTICS

ARtillery Intelligence

Executive Summary

How do consumers feel about mobile AR? Who's using it? How often? And what do they want to see next? Perhaps more important, what are non-users' reasons for disinterest? And how can app developers and anyone else building mobile AR apps optimize product strategies accordingly?

These are the questions we set out to answer. Working closely with **Thrive Analytics**, **ARtillery Intelligence** wrote questions to be presented to more than **43,000** U.S. adults through Thrive's established consumer survey engine. The results are in and we've analyzed the takeaways in a narrative report.

This follows several months of ARtillery Intelligence Briefings that examine various segments of, and developing use cases for, consumer AR. Now a deeper view into real consumer usage and attitudes validates those narratives while providing new dimension on mobile AR strategies and opportunities.

So what did we find out? At a high level, mobile AR usage has grown to **29 percent** of U.S. adults. Many of these users experience AR through dedicated AR apps, such as those built on Apple's **ARkit** and Google's **ARCore**. But there's greater engagement with lower-friction experiences such as "AR-as-a-feature."

Mobile AR users also appear active and engaged, with **59 percent** reporting that they use it at least weekly. The top app category is gaming, which we attribute to **Pokémon Go's** popularity. But other categories such as social AR and visual search continue to make headway. Mobile AR users also indicated high levels of satisfaction with their experiences.

But beyond these and a few other positive signals, there are negative signs and areas for improvement. For example, non-mobile AR users report low likelihood of adopting, and an explicit lack of interest.

This disparity between current-user satisfaction and non-user disinterest continues to underscore a key challenge for AR: you have to experience it to *get it*. But there's little drive for non-users to get that first taste. This boils down to a classic "chicken & egg" dilemma that represents a core marketing challenge for AR.

Put another way, AR's highly visual and immersive format is a double-edged sword. It can create strong affinities and high engagement levels. But the visceral nature of its experience can't be communicated to prospective users through traditional marketing, such as ad copy or even video.

The same chicken & egg challenge was uncovered in corresponding VR consumer research that we'll produce in a report like this next month. This makes it a common challenge for immersive tech, though AR is relatively advantaged by mobile ubiquity. Still, it will take time and acclimation before AR reaches a more meaningful share of the population.

Meanwhile, there are strategies to accelerate that process and to build AR apps that align with consumer affinities. In this report, we'll examine such strategies and unpack the latest survey results. We'll also examine the ways that Covid-19 impacted this year's results. As always, the goal is to empower ARtillery Pro subscribers with a greater knowledge position.

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Key Takeaways

- **Among Wave IV survey respondents 29% have actively experienced mobile AR at least once.**
- This represents healthy adoption, but also substantial headroom to grow in the coming years.
- We expect adoption to accelerate in future survey waves, similar to early smartphone adoption.
- This year's results were impacted by Covid-19 positively (social, e-commerce) and negatively (visual search).

- **51% have used "AR-as-a-feature," 48% ARCore apps, 43% ARkit apps, and 17% web AR.**
- AR-as-a-feature (AR within non-AR apps) holds a leading position by a narrow margin for the third year.
- Practiced by top AR apps like Snapchat and Pokémon Go, ARaaF is validated in real-world success.
- Though apps have an early lead, web AR's advantages could vault it forward in the coming years.

- **78% of mobile AR users are active at least monthly. 59% are active weekly or greater.**
- These frequency ratings are up considerably from Wave III, reflecting AR's ongoing cultural assimilation.
- Frequency growth can also be attributed to Covid-era demand signals for quarantine-friendly AR lenses.
- In that sense, AR piggybacks on applicable Covid-advantaged sectors like gaming, social and e-commerce.
- Otherwise, mobile AR that fuses novelty with frequency (e.g., social messaging) can achieve high active use.

- **Games lead mobile AR use (86%), followed by social (41%) and product visualization (34%).**
- Gaming's leading position is largely attributed to Pokémon Go, which continues to thrive as a mobile game.
- Social app success can result from sticky/frequent behavior, viral growth, and network effect.
- Product visualization can save users time and money through more-informed e-commerce transactions.

- **Mobile AR users want more games (64%), education (43%), social (40%), and shopping (39%).**
- In-store retail AR experiences dropped out of the top-five aspirational use cases in Wave IV.
- Interest instead shifted to Covid-aligned use cases such as product visualization for e-commerce.
- We believe that physical-world-oriented AR use cases (retail, visual search), will rebound in Wave V.

- **75% of mobile AR users are either satisfied (45%) or very satisfied (30%) with their experiences.**
- Like the above frequency metric, these high satisfaction ratings are up considerably from Wave III.
- This could be due to AR product evolution, cultural assimilation, and alignment with Covid-19 dynamics.

- **The bad news: 54% of non-mobile AR users report definitive disinterest, and 28% report confusion.**
- Stark variance between user and non-user attitudes underscores AR's "chicken & egg" dilemma.
- Because it's so visual and visceral, users have to first experience AR to realize its benefits.
- Yet without that experience and perspective, there's little motivation to get a first-taste.
- Compounding these challenges, AR's immersive qualities can't be captured in ad copy or video.

- **63% of mobile AR users will pay $1.00 or more for apps. 15% will pay $5.00 or more.**
- This compares with 19% of non-users who will pay $1.00 or more for apps. 45% won't pay any amount.
- Price sensitivity underscores another stark variance in attitudes between users and non-users.

- **In-app purchases (IAP) showed strong acceptance among users (14%) and non-users (30%).**
- IAP should always be considered as it addresses the largest range of interests.
- Pokémon Go has made $4 billion+ to date through IAP, inheriting an established model from mobile gaming.
- Revenue per user is often greater with IAP due to the behavioral economics of microtransactions.

- **AR's wider-scale adoption will require consumer education, assimilation and at least one "killer app."**
- There's not enough of an adoption impetus yet for mainstream consumers to flock to AR en-masse.
- Broad AR appeal and high-frequency could result from valuable "all-day" utilities such as visual search.

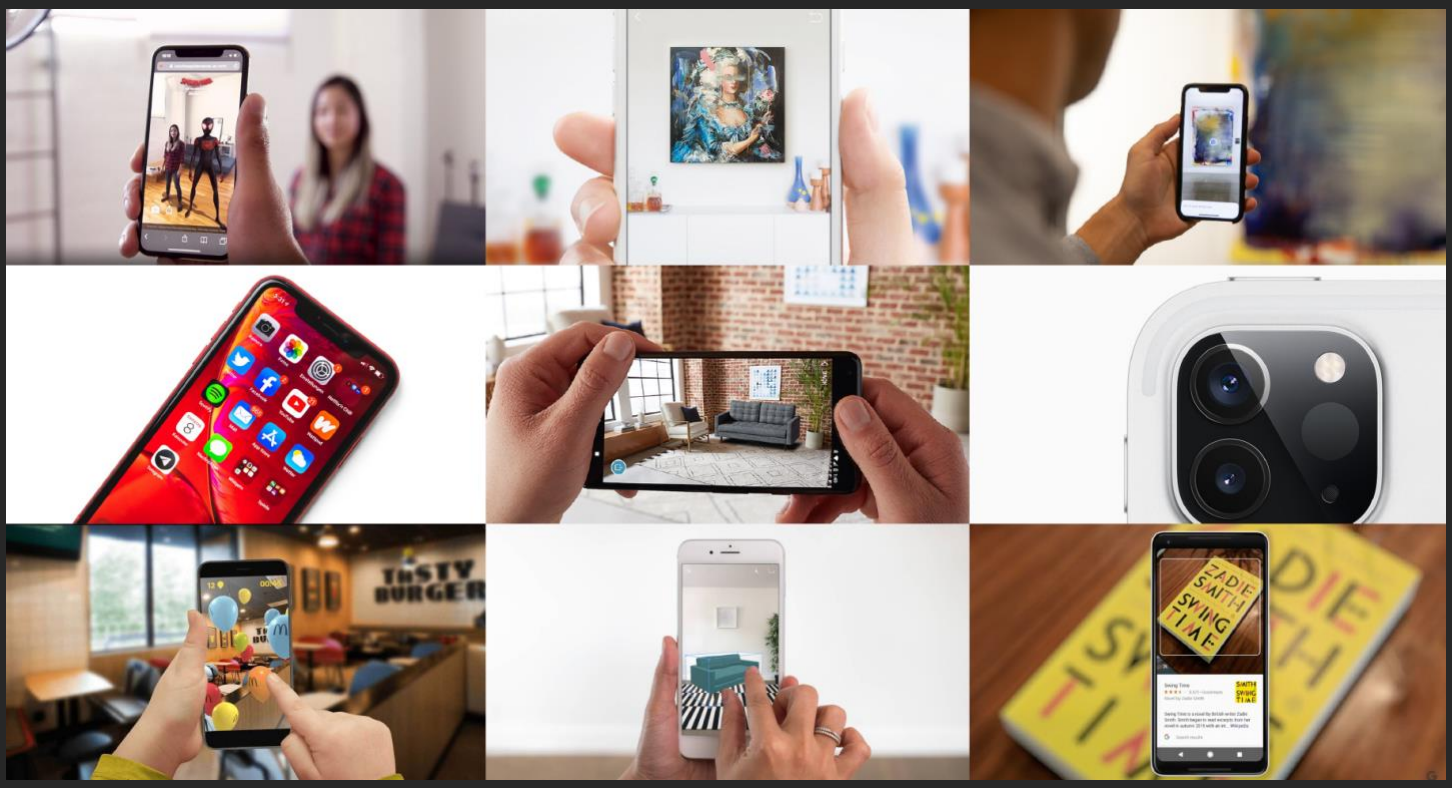
Introduction: A Snapshot

ARtillery Intelligence monthly reports often cover topics like AR's social, advertising and commerce strategies. This compels additional dimension into AR usage. And the best way to get that is to ask consumers how they feel. The result is the latest AR consumer survey.

Working closely with **Thrive Analytics**, ARtillery Intelligence wrote questions for a sample of more than **43,000** U.S. adults. This represents the fifth wave of Thrive Analytics' **Virtual Reality Monitor** (and the fourth wave that includes AR). Now that the results are in, there are several implications and takeaways.

The survey results are a telling snapshot of mobile AR adoption, which we'll detail in the coming pages. That will include charts and a narrative story arc that unpacks strategic takeaways, and our outlook for mobile AR. But before we take that deeper dive, here's a highlight reel of survey findings.

- **29%** of consumers have tried mobile AR, up from **26%** in Wave III.
- **48%** of mobile AR users have used ARCore apps, **43%** ARkit apps, and **17%** web AR.
- **75%** of mobile AR users are either satisfied (**45%**) or very satisfied (**30%**).
- **78%** of mobile AR users are active at least monthly, **59%** are active at least weekly.
- **86%** of mobile AR users have used games, **41%** have used social apps.
- **64%** of users want more games, **43%** want education apps, and **34%** want in-store retail apps.
- **63%** of mobile AR users would pay **$1.00** or more for an app, **15%** would pay **$5.00** or more.
- **45%** of non-mobile AR users are unwilling to pay any amount for mobile AR experiences.



About the Survey

Before going deeper into survey results, we'll pause here to add context to the findings and methodology. A key question is, how many and what individuals answered the survey?

Starting with sample size, this survey wave includes more than **43,000** U.S. adults. Segments of this sample are represented, depending on the question, as dictated by the survey logic. For example, with questions posed just to AR users, they represent a sample segment that exceeds **7,000** U.S. adults (non-AR users are more populous).

Going deeper into demographics and psychographics, respondents break down in population-representative ways. Specifically, the survey sample spans a wide range of U.S. adult consumers with even distribution of key variables like gender, age, and income.

This is all a function of **Thrive Analytics'** longstanding position and competency in consumer survey research. Its time-tested methodology and survey network comply with industry standards and best practices.

"AR and VR are still in early-adoption phases," said **Thrive Analytics** managing partner **Jason Peaslee**. "There are still technology challenges, but we think AR & VR have the ability to transform the way people work, connect, and learn. We're excited about the prospects, and committed to measuring them."

Image Credit: Amazon

Part I: AR Users

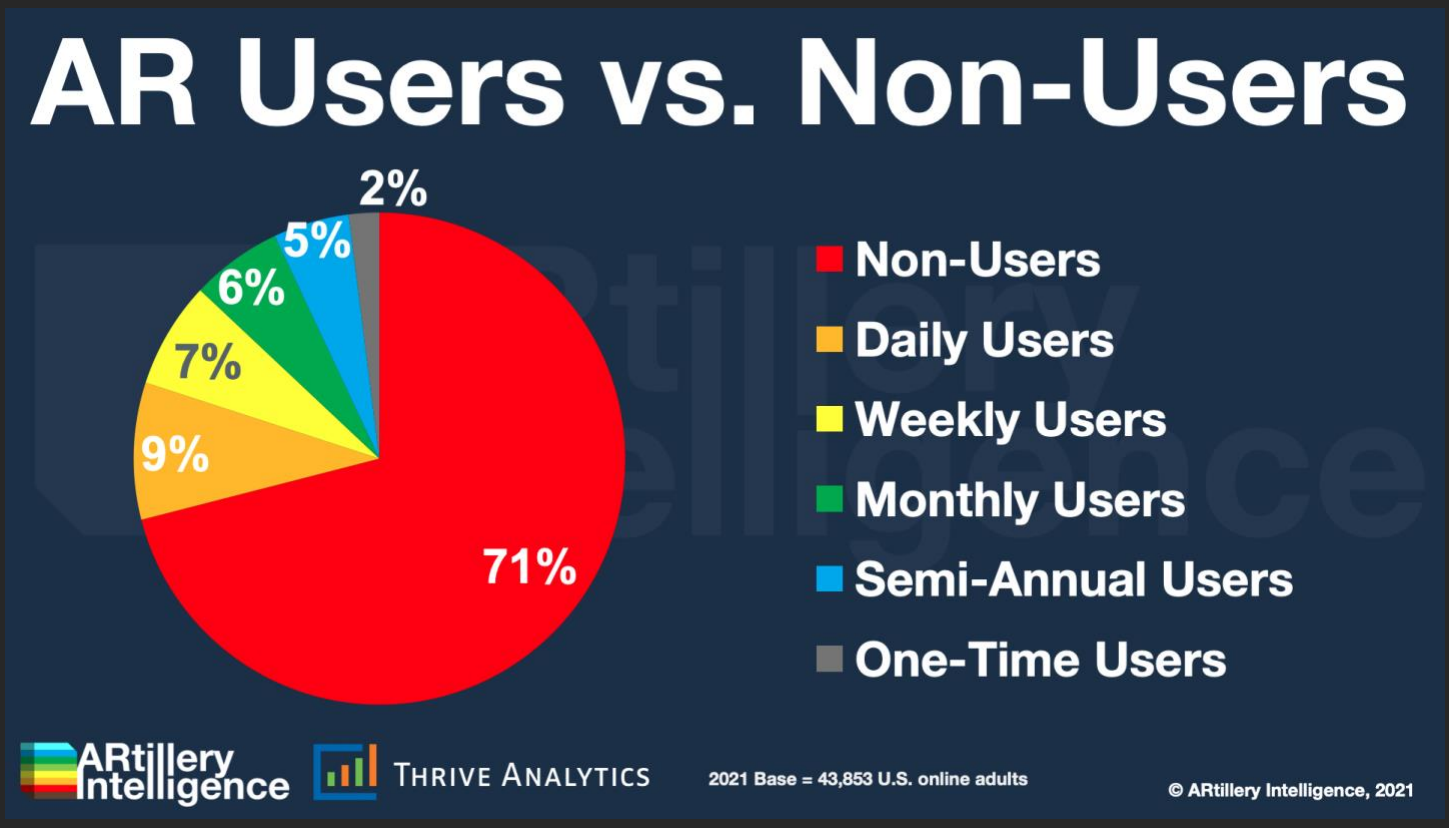
To organize strategic takeaways in this report, we've delineated the sentiments of AR ***users*** and ***non-users***. Both can provide telling signals for AR product development and strategy refinement. Starting with current users, what are they saying and doing with respect to mobile AR behavior? The following sections dive in.

Mobile AR Penetration

Starting at the very top, what's mobile AR's overall penetration and adoption among consumers? Survey results peg it at **29 percent** of U.S. adults. This is up from **26 percent** in Wave III of the study, indicating positive movement. It also counters claims in the tech press that AR adoption has flatlined.

In fact, adoption in mid-twenty percent ranges – including measured year-over-year growth – signal a combination of healthy traction and headroom to grow. AR is still in early stages of its industry lifecycle, and we expect usage to accelerate in future survey waves as consumer comfort levels – as well as AR itself – advance.

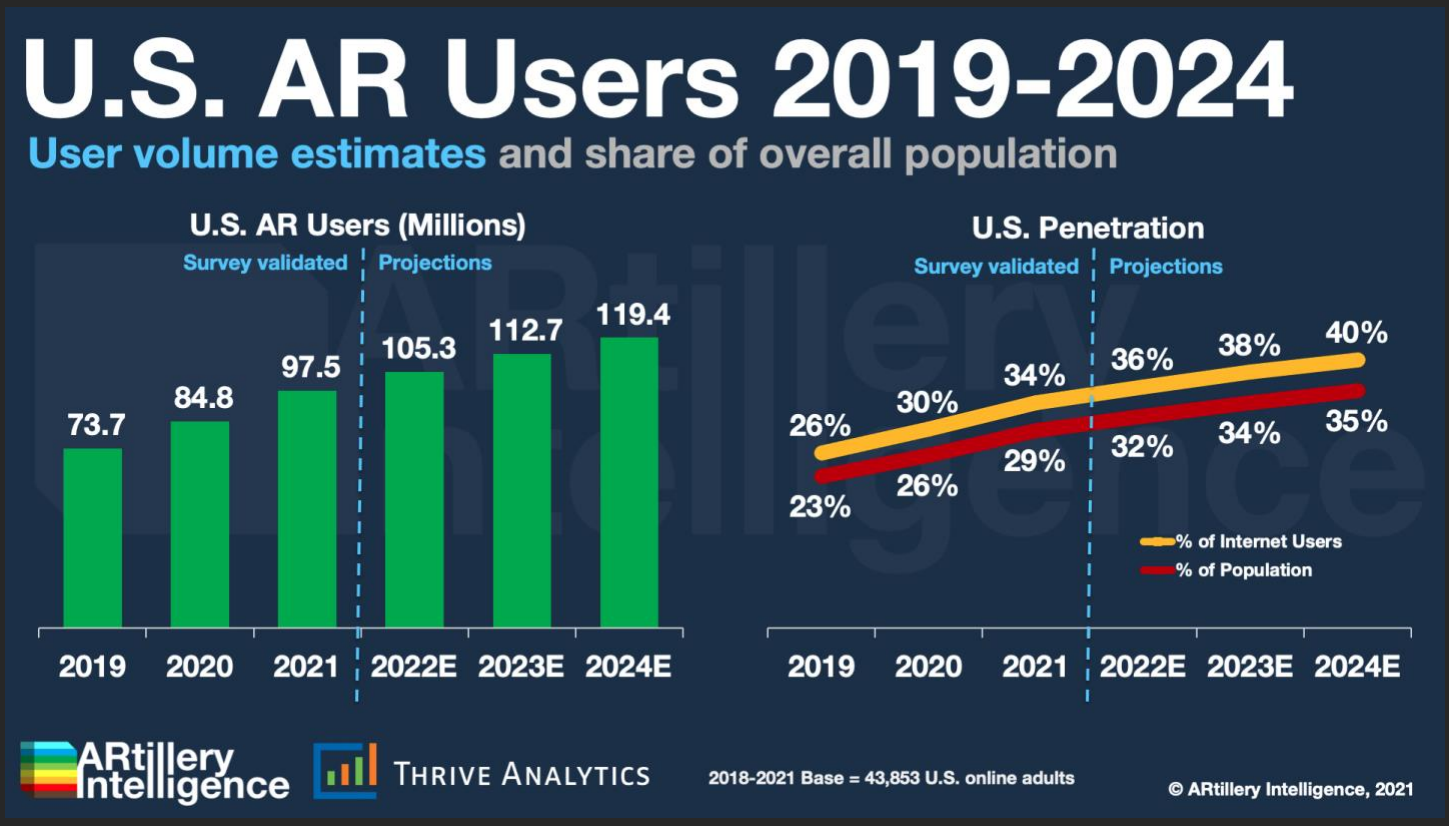
Meanwhile, usage levels can also be seen in the figures below, indicating frequency of engagement. We'll dive into these distinctions and their implications later in this report.



Mobile AR Market Size

Given AR's usage share among U.S. adults, how does this translate to overall market size? Applying the above figure to the U.S. adult population indicates that there are roughly **97.5 million** adults who have tried AR, up from **84.8 million** last year.

To pause for definitions, these totals measure U.S. adults who have used AR at least once. This broad definition lets us start with a larger population, then drill down for insights. For example, we'll explore in this report how this overall usage breaks down by frequency.



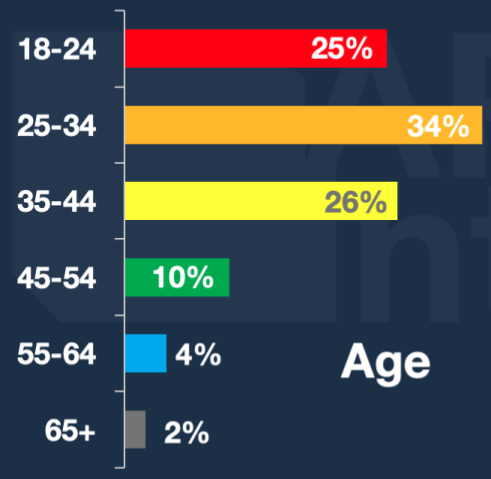
Mobile AR User Profiles

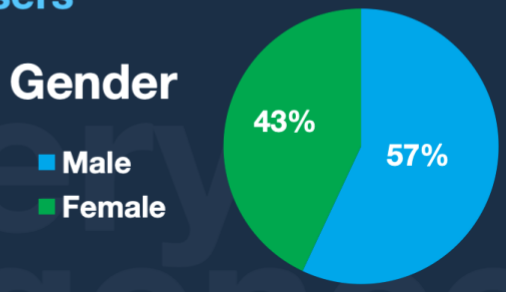
As for who these users are, demographically speaking, they skew male, younger, and middle class. Specifically, **59 percent** of AR users are 18-34 years old, **57 percent** are male, and **49 percent** have annual household incomes between **$25,000** and **$75,000**.

If we flip the analysis to examine AR usage *within* each demographic group, there are similar breakdowns. **57 percent** of Gen-Z, **53 percent** of Gen-Y, and **7 percent** of baby boomers have used AR. **41 percent** of males and **24 percent** of females have done so.

U.S. AR User Profile

Demographic Breakdown Among All AR Users





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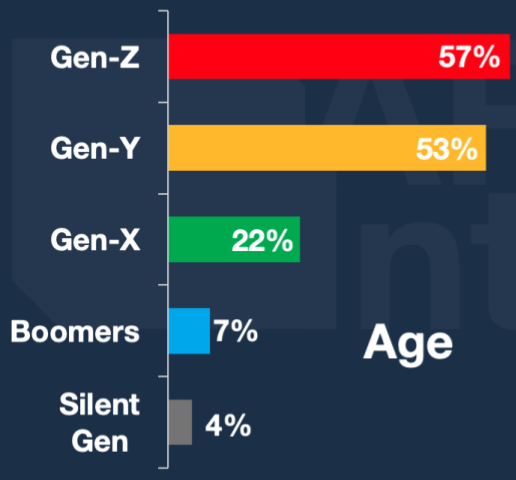
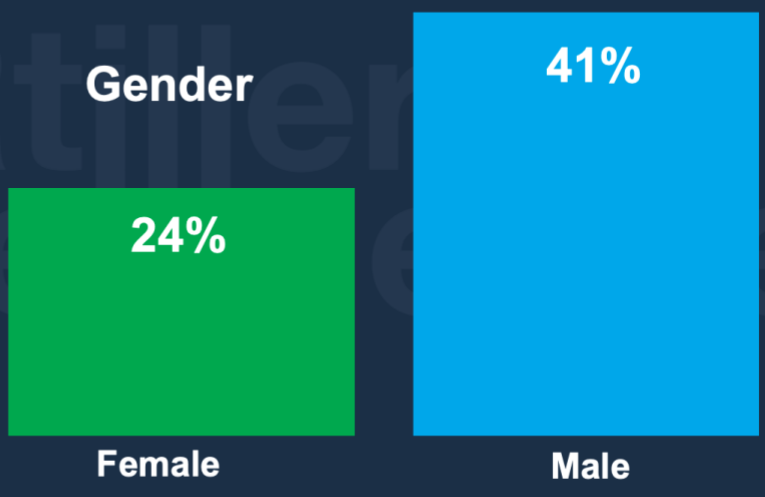
2021 Base = 7,139 U.S. online adults

U.S. AR Penetration

AR Usage Within Each Demographic Segment





ARtillery Intelligence | THRIVE ANALYTICS

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Mobile AR Delivery Vehicles

Drilling down one level, how and in what formats are AR users consuming the technology? Given that **Apple** and **Google's** AR developer kits (**ARkit** and **ARCore**) have democratized mobile AR, they're collectively the leading delivery channels.

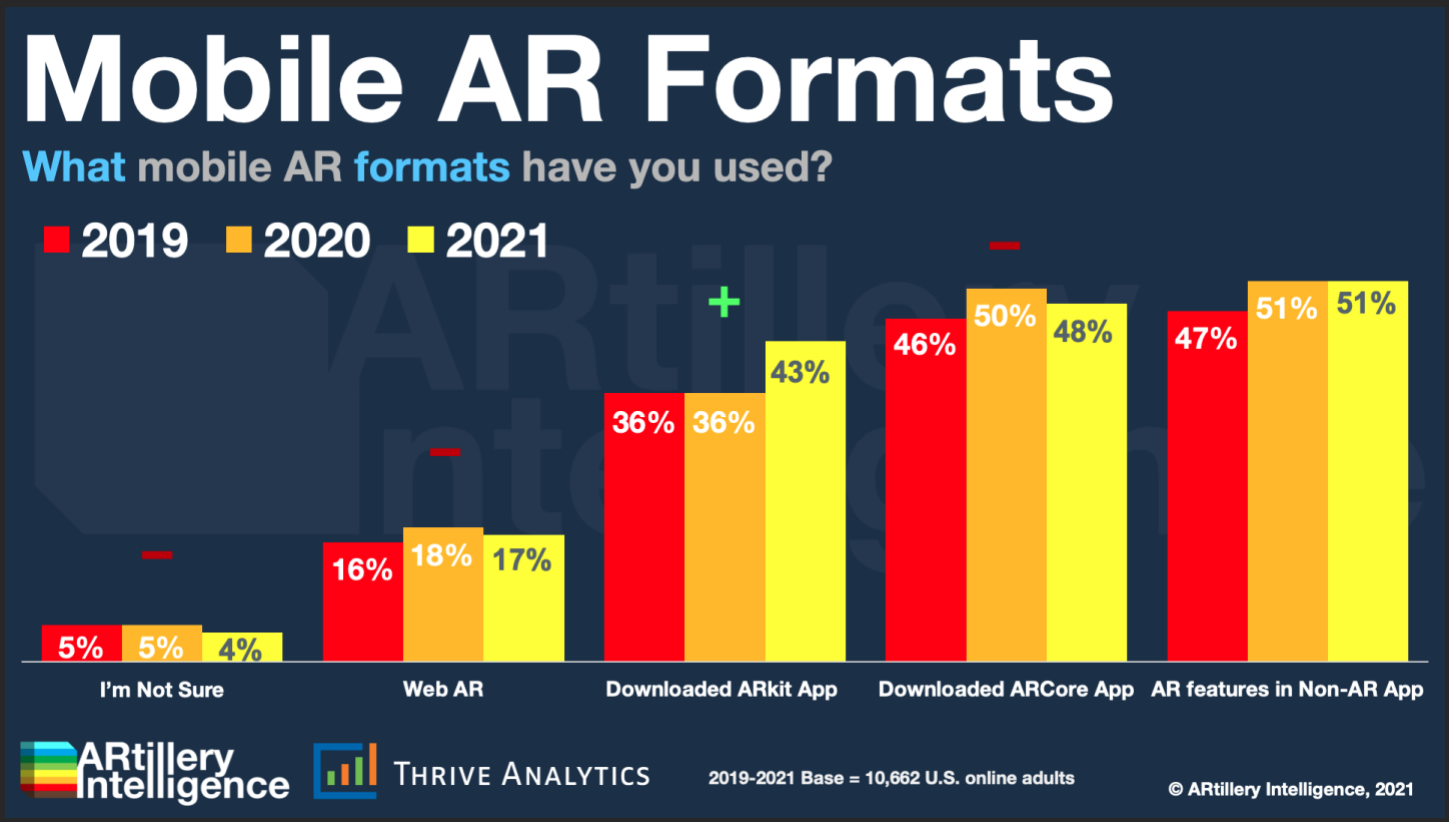
Specifically, **48 percent** of AR users report using **ARCore** apps while **43 percent** report using **ARkit** apps. This split is surprising due to these platforms' respective market shares. Though **ARCore** will eventually reach a larger **Google Android** base, **ARkit** technically has an early lead of compatible **iPhones**.[i]

But more interesting is what lies beyond these platforms. As we've examined[ii], AR apps aren't always the optimal vessel, given download friction. That leaves two formats seen in these results – one that's already outperforming and one that holds potential.

The outperforming format is what we call "AR-as-a-feature" (ARaaF) which received the most responses at **51 percent**. This format lowers adoption barriers by planting AR functionality within popular apps. In fact, the most-used AR experiences to date – **Pokémon Go** and **Snapchat Lenses** – are considered ARaaF.

The second area is Web AR. These are AR experiences delivered in the mobile browser. Because AR is still early and unproven, there's little motivation for consumers to go through the typical friction of downloading apps. Web AR is conversely activated with just a web link – or other calls-to-action such as QR codes – and avoids platform-compatibility issues.

Web AR still has some quality and capability deficiencies compared to native apps, but that's quickly changing due to the work of innovative startups like **8th Wall** and others.[iii]



Mobile AR Experience Types

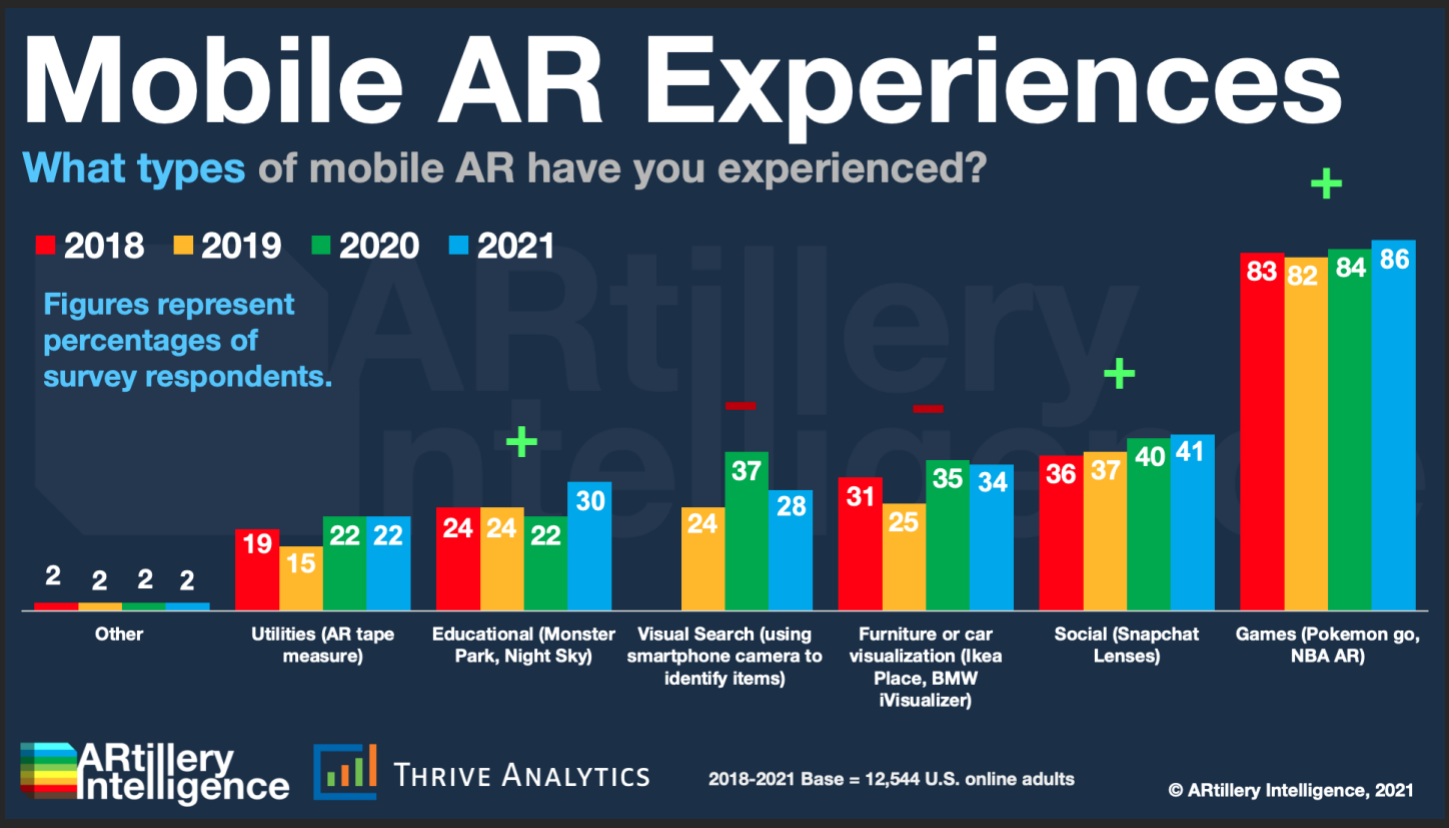
Drilling down yet another level, what content categories are mobile AR users consuming most? As mentioned, the most popular flavors of AR so far are **Pokémon Go** and **Snapchat Lenses**. So logically, the survey results peg gaming (**86 percent**) and social (**41 percent**) as top experience types.

As a matter of process and methodology, we should mention here that we explicitly name these experiences as examples when asking survey respondents about the corresponding experience types. In order to avoid gray area and false positives, it's always smart to use demonstrative language in survey questions.

While we're at it, we'll address another looming question: Is **Pokémon Go** AR? Many purists argue that it is not. Our take, examined in our report on **Pokémon Go**[iv], is that any graphical, audible, or geographically-contextual augmentation – including **Pokémon Go** – aligns with a meaningful definition of AR.

As for specific success factors, **Pokémon Go** has an optimal mix of game mechanics, novel updates, challenging play, and real-world interaction. In fact, after receding from its 2016 peak, the game has quietly returned to high engagement levels and revenue performance.[v]

As for social AR lenses, success factors include simple activation and shareability. There's also a fun element, amplified by a social-graph driven network effect and virality. This has caused **Snapchat** to exceed **200 million**[vi] daily AR users as of this writing, and strong revenue growth from paid AR lenses.[vii]



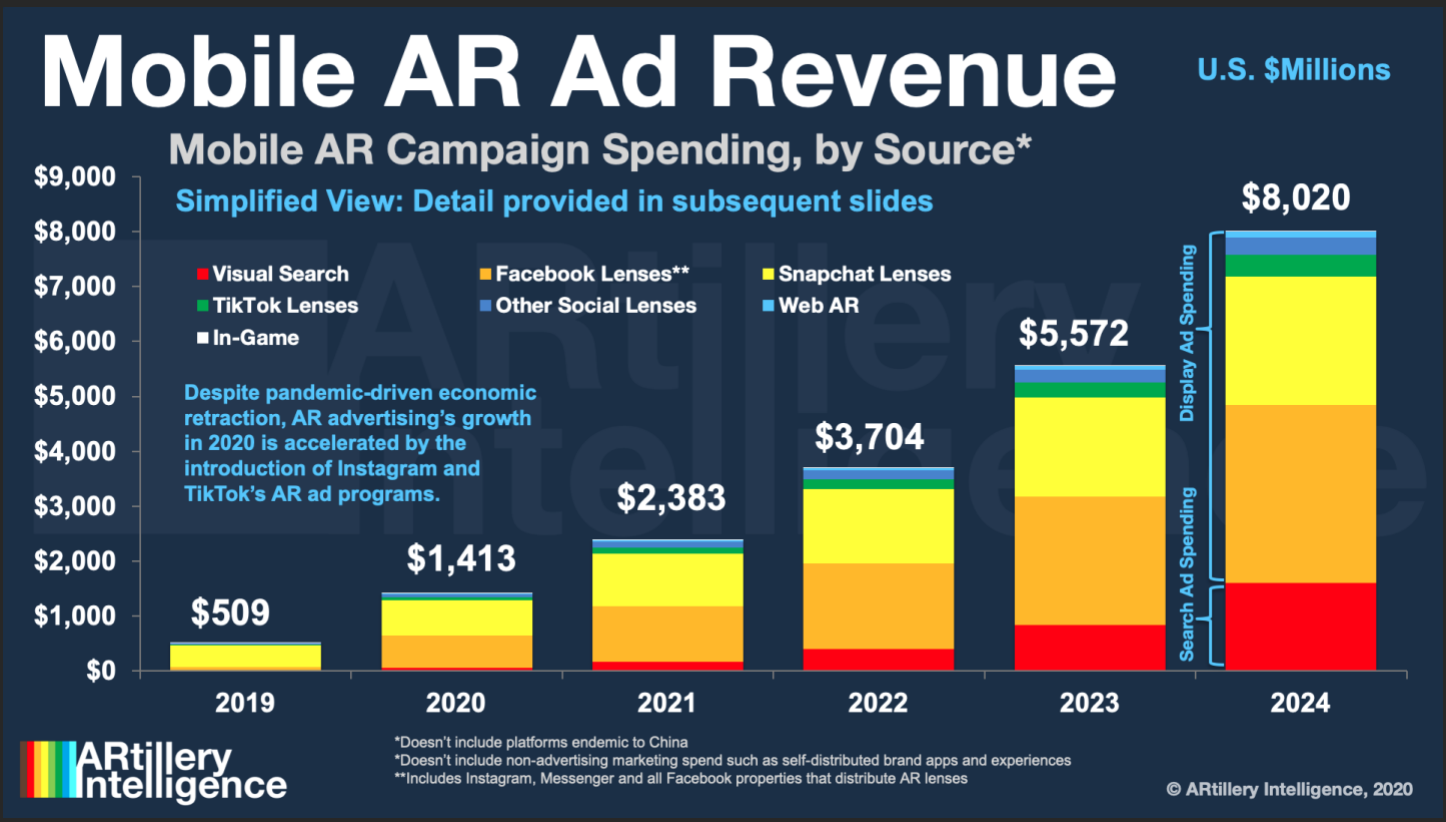
Motivating Factors

To take a “sidebar” to expand on the above, an ongoing goal for **Snap** and other AR lens players like **Facebook** is to boost their core products’ engagement and repeat use. They’ve seen that AR can not only accomplish this but can also directly drive revenue. In fact, AR ads drove an estimated **$1.4 billion** last year, growing to **$8.02 billion** in 2024 (see below).[viii]

Speaking of motivation, **Google** wants visual search to support and future-proof its core search business.[ix] As shown by **Google Lens**, users can point their phones at real-world items to contextualize them. Notably, visual search declined from **37 percent** in Wave III to **28 percent** in Wave IV, after growing from Wave II to Wave III. This may be due to Covid-inflicted lockdowns that prevent physical-world visual search experiences to some degree.

Regardless of this decline, we’re bullish on visual search. It carries a high-frequency use case that flows from its versatility and broad applicability... just like search itself but with the physical world as its canvas. The value of holding up one’s phone to contextualize real-world items – commercial or not – we believe will have wide appeal and applicability.[x]

Lastly, it’s worth noting the use of educational AR experiences, which grew from **22 percent** in Wave III to **30 percent** in Wave IV.



Mobile AR Satisfaction Levels

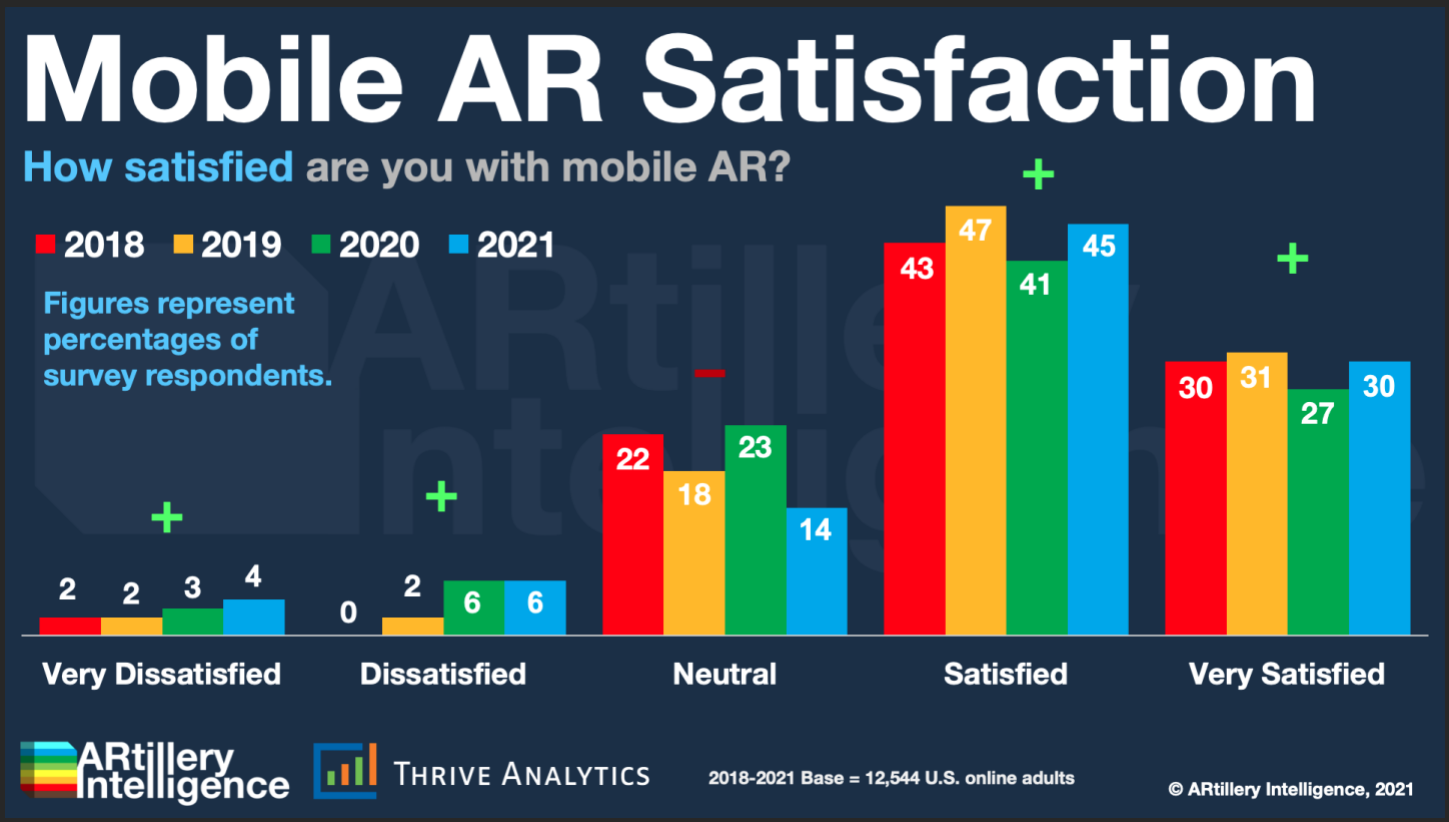
Another key signal for mobile AR health is survey respondents' satisfaction. **75 percent** are either satisfied (**45 percent**) or very-satisfied (**30 percent**). **14 percent** remain neutral and **six percent** report low or very-low satisfaction. This represents growth from Wave III within the highest satisfaction levels.

Furthermore, there are few consumer products that show such high satisfaction. As a point of comparison, the corresponding satisfaction levels in the VR findings[xi] that we published last year are also high. But they're lower than these AR sentiments, with **55 percent** either satisfied or very satisfied.

Overall, this tells us a few things. For one, AR's highly-visual and immersive format is already proving to captivate consumers. This is largely due to its revolutionary – rather than evolutionary – interface when compared with non-immersive mobile app experiences that have become routine.

It also counters some of the anecdotal observations that we and others have made about the subpar and underwhelming state of mobile AR experiences so far. We stand by the assertion that apps will evolve a great deal – just as early **iOS** apps did – but it's notable that high satisfaction is already present today.

With three waves of survey research, consistent findings are another point of validation. Indeed, with a larger collective sample and four waves of research, higher than expected satisfaction levels can't be chalked up to anomaly. Future waves will provide additional validation, insight, and longitudinal analysis.



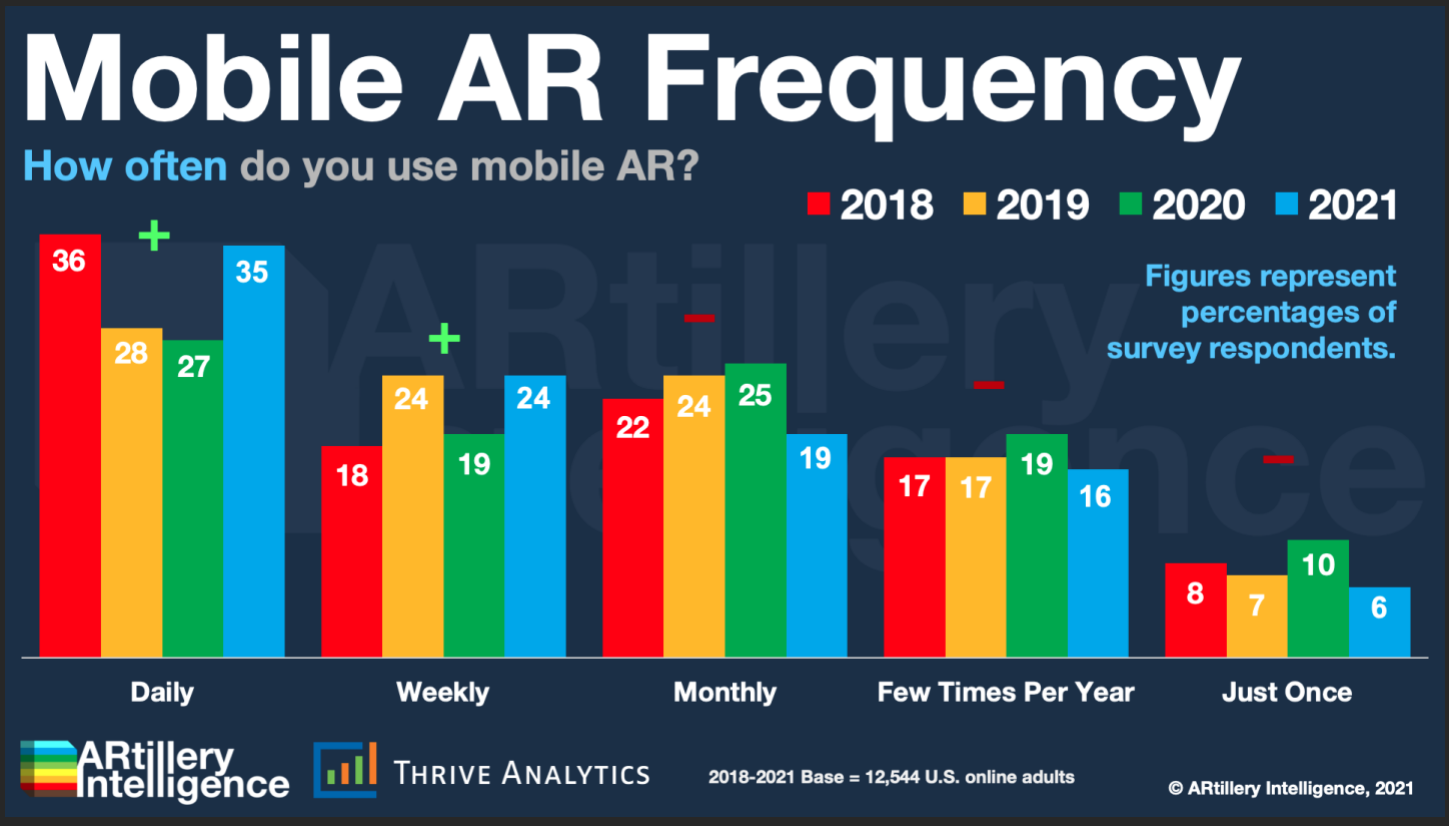
Mobile AR Usage Frequency

Picking up where the last section left off, a key variable in tracking mobile AR health is how often it's being used. Due to mobile AR's inherent arm fatigue, relatively short sessions should be counterbalanced by high frequency. So the name of the game is to evoke active use or "replayability" in any AR experience.

Mobile AR experiences that fuse the novelty of augmentation with frequent or repeatable activities show the most monetization potential. These "sticky" behaviors include social messaging, gaming, and utilities like visual search. These are activities that naturally happen daily or more.

Drilling into the data, **78 percent** of mobile AR users are active at least monthly, **59 percent** at least weekly, and **35 percent** daily. These are high figures by mobile app standards[xii] and indicate that active-use challenges endemic to mobile apps – reflective of overcrowded app marketplaces – aren't as pronounced in AR.

Furthermore, one thing that sticks out from these results is the growth in daily (**35 percent**) and weekly (**24 percent**) use compared to Wave III. After falling in Wave III, these usage levels have rebounded considerably in Wave IV (see below). This could be a strong signal and a leading indicator for mobile AR growth.



Cross-Check: Frequency + Format

Staying with the topic of frequency, we can gain additional dimension by combining the variables that have been examined so far. In other words, what AR formats are driving the highest-frequency use? And how does reported AR frequency map to AR experience types and satisfaction levels?

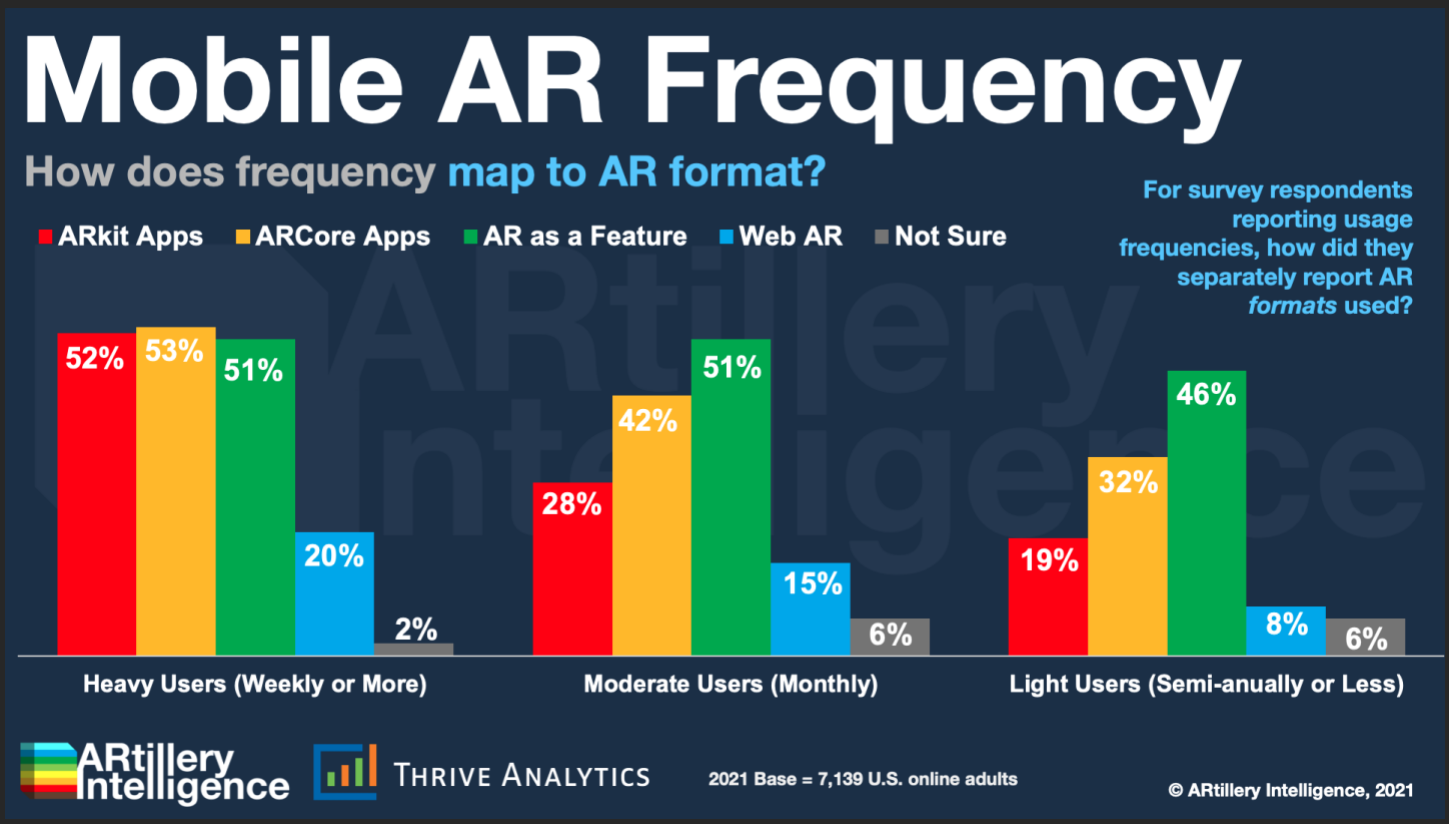
To do this, we cross-referenced some of the survey results. For example, among respondents reporting usage frequency, how did they separately report AR formats? Just like in the overall format breakdown examined earlier, **ARCore** apps and "AR-as-a-feature" (ARaaF) lead in usage frequency.

Going deeper into AR formats at different frequency levels reveals additional insights. For example, AR-as-a-feature exceeds **ARCore** for moderate users. This stands to reason as ARaaF is a format that appeals to semi-casual users because it doesn't require dedicated downloads and it delivers AR to the apps where users already spend time.

As indicated earlier, ARaaF most notably includes **Pokémon Go** and **Snapchat Lenses**. These are both AR features in non-AR apps. Their ease of use and accessibility – nestled within already-popular apps – can be attributed for this high frequency. Put another way, they make the AR experience easy to get to.

This is a key takeaway for AR developers or strategists. To drive frequent use, it continues to be validated that planting AR in users' existing paths is more effective than making them download separate AR apps. This "training wheels" approach continues to pop up in our research.[xiii]

Meanwhile, Web AR is worth watching for all of the same reasons. It can be launched with little friction, directly from the ubiquitous browser.



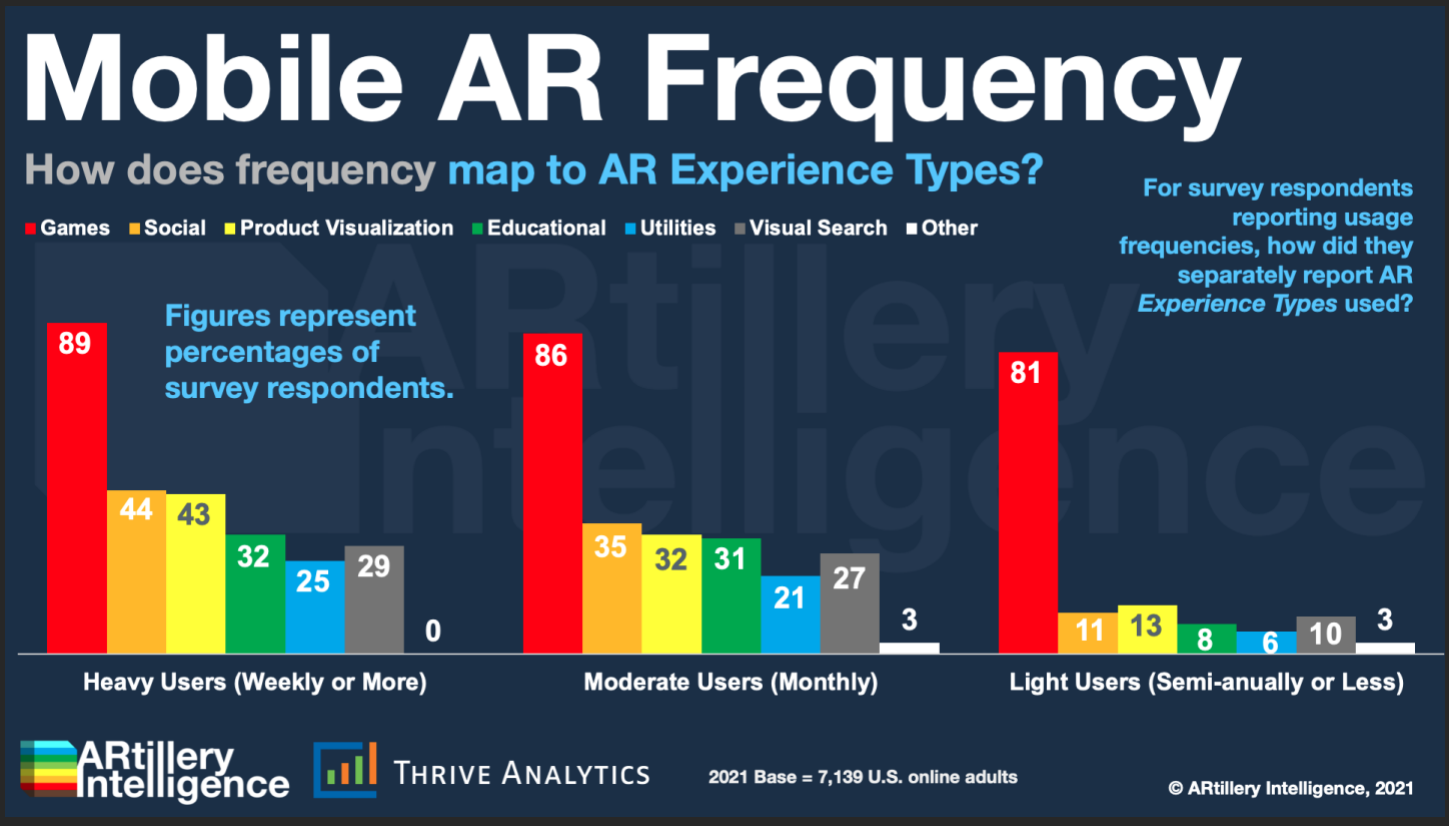
Cross-Check: Frequency + Type

Sticking with the same exercise of cross-referencing mobile AR frequency with other attributes, how does it map to AR experience types? As examined earlier, AR experience types go one level deeper than *format* (the previous slide) to more granular content categories (e.g., social, gaming, etc.).

For survey respondents reporting usage frequencies, how did they separately report the AR experience types they've used? Just like in the overall content breakdown examined earlier, AR gaming leads in various frequency subdivisions. Social AR likewise follows in most frequency groupings.

Going deeper into AR categories at different frequency levels reveals additional insight. For example, social AR and product visualization scored relatively high among respondents who reported daily use. This indicates these two AR use cases are naturally recurring and can be used to boost user engagement.

Visual search had a similar divergence across frequency levels. Its engagement levels are greatest among heavy users (**32 percent**) compared to moderate (**31 percent**) and light (**8 percent**) users. This validates the earlier assertion that visual search is a naturally high-frequency behavior.



Cross-Check: Frequency+ Satisfaction

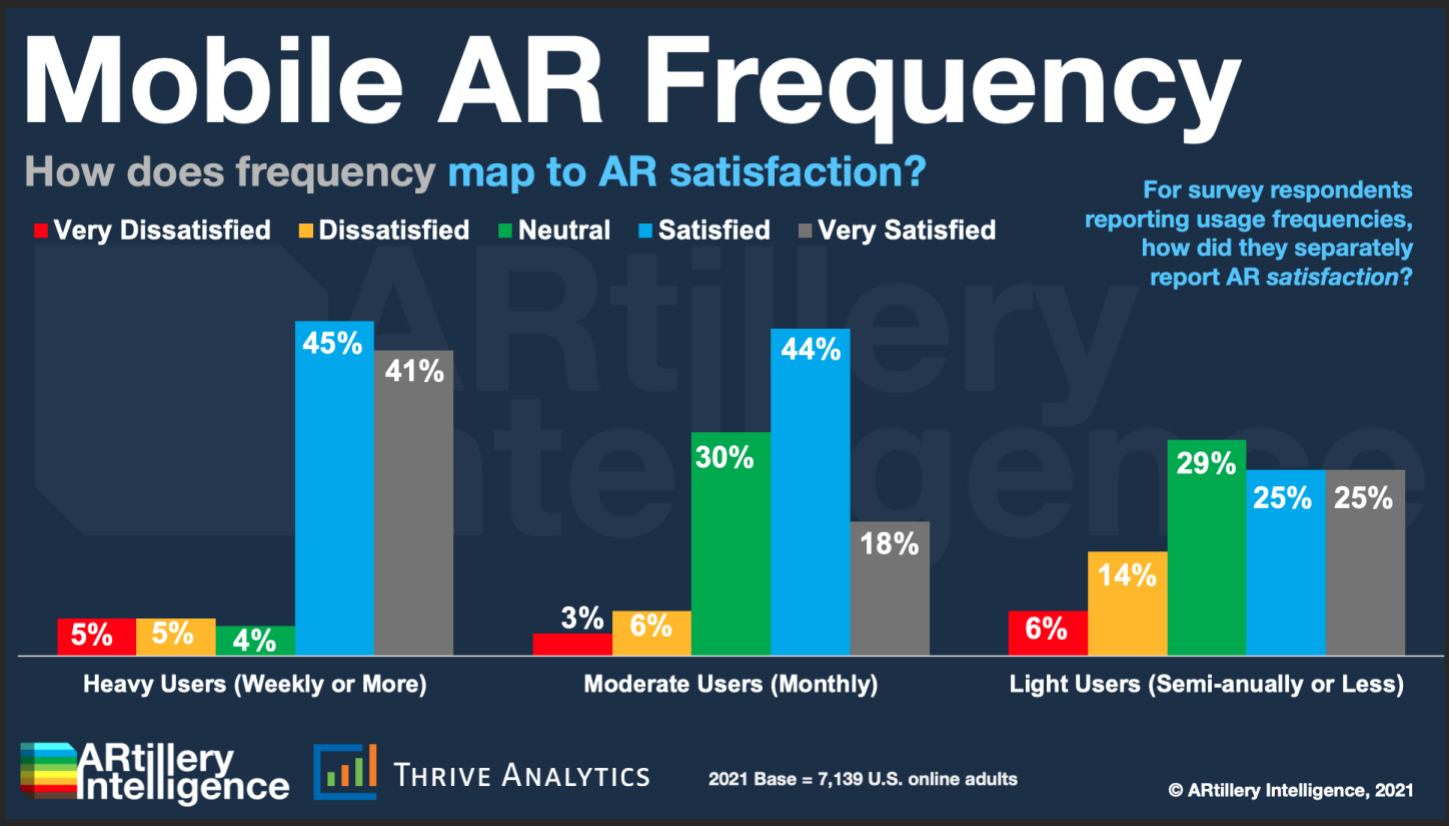
Continuing the cross-referencing exercise, how does mobile AR usage frequency map to user satisfaction? The question – as in the previous two sections – boils down to how survey respondents at various usage frequencies separately answered the question of how satisfied they are with AR?

The high-level takeaway is that the highest-frequency mobile AR users (*weekly or more*) reported the greatest satisfaction (*satisfied* and *very satisfied)* This isn't surprising, as frequency should map to satisfaction. But a few nuances emerge once we dig deeper.

For example, among "satisfied" users (follow the blue bars in the chart below), monthly use (**44 percent**) is mostly at parity with weekly and daily use (**45 percent**). However, "very satisfied" users show a strong divergence between monthly use (**18 percent**) versus weekly and daily use (**41 percent**).

One translation to these data is that boosting satisfaction to "very satisfied" levels can have a disproportionate impact on frequency. That should be an obvious goal of any product, but the strategic takeaway is that there can be an outsized payoff in usage frequency, which directly impacts monetization potential.

The key question is 'how?' Boosting satisfaction levels will involve product and UX tactics that continue to develop. So far, they include some of the lessons examined later, such as social components (e.g., messaging), utility, and gamification in AR experiences. Usage patterns will also evolve over time.



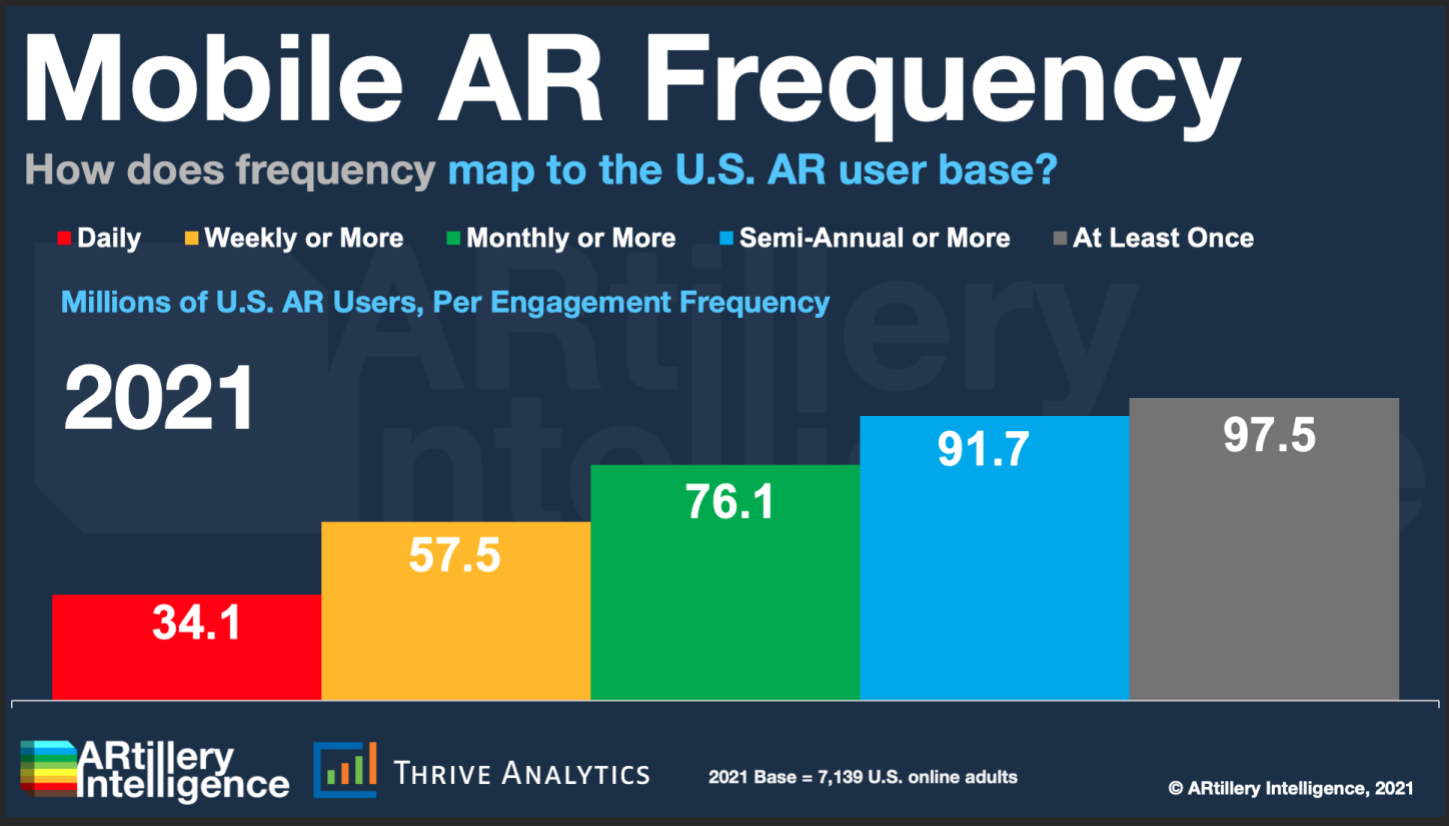
Cross Check: Frequency+Market Size

Continuing the cross-referencing exercise, what do frequency responses tell us about the size of the U.S. AR *active* user base. Earlier we stated that top-level AR adoption numbers included users who have engaged at least once – a useful starting point but it compels more granularity.

Now we take that additional step. Similar to the cross-referencing accomplished in previous sections, how does AR frequency array against AR's U.S. user base quantified earlier? By performing this cross-check, we see **34.1 million** daily AR users, **57.5 million** weekly+ users, and **76.1 million** monthly+ users.

To qualify this further, frequency groupings don't collectively add up to the total (**97.5 million**), due to overlap. In other words, "monthly or more" users include respondents who also indicated daily or weekly use. Monthly active user (MAU) metrics typically tally one or more uses in a 30-day period.

Furthermore, these active-usage groupings should be prioritized over top-level calculations for the U.S. user base, as they provide a more granular indication of usage. Put another way, the top-level figures provided earlier measure *users* in a binary manner, while layering in frequency better signals *usage*.



Mobile AR Price Sensitivity

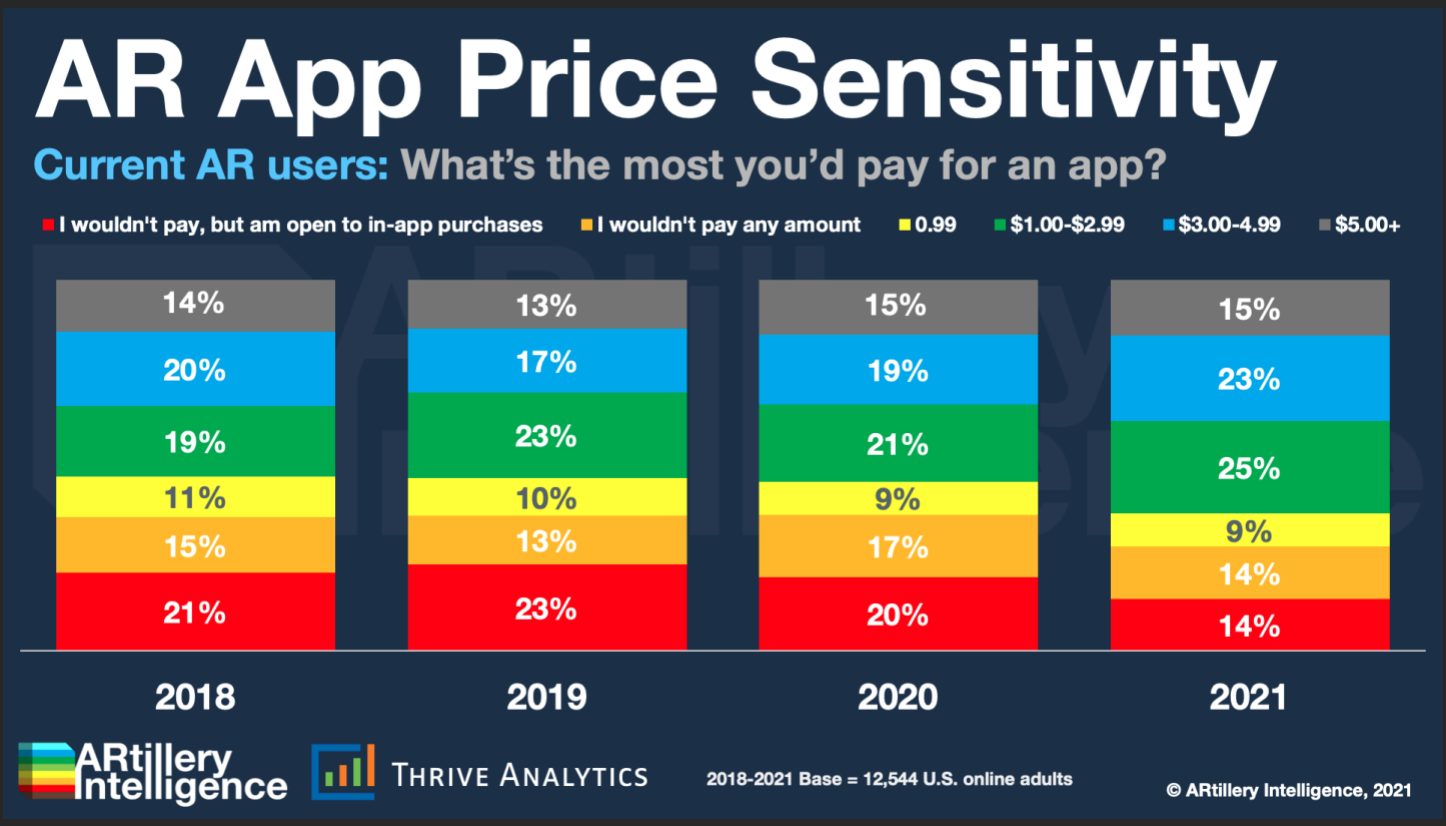
Next on the list of survey questions is the all-important matter of price. This is delineated between mobile AR users and non-users (non-users are covered later) with varying responses for each. Starting with users, **63 percent** will pay **$1.00** or more for AR apps. And **15 percent** will pay **$5.00** or more.

These results represent strong demand signals, considering price sensitivity in the broader universe of mobile apps. We attribute this higher willingness to pay for mobile AR to the same factors explored earlier regarding satisfaction. High satisfaction with AR logically correlates to more willingness to spend.

Further delineating AR users' cost sentiments, the most popular price point (**25 percent**) is between **$1.00** and **$3.00**. This pricing tier leads for the third year in a row and has increased its margin in Wave IV. It also notably exceeds in-app purchases which have proven successful in popular apps like **Pokémon Go**.

Specifically, the game has derived **$4 billion+** from in-app purchases.[xiv] The virtues of this payment structure trace back to its low barriers. Given AR's early and unproven state, free apps (with optional in-app purchases), are an easier sell. This is why they appeal most to non-AR users, as we'll explore later.

Back to AR users, their sentiments can be valuable inputs to any app pricing strategy that looks to target existing or already-engaged AR enthusiasts. Their demand levels and corresponding price elasticity should be primary inputs to inform such strategies.



Mobile AR User Aspirations

We'll conclude our analysis of AR *current-user* sentiments on an aspirational note. Equally important than consumers' current AR experience types is their future desire. What do they want to see next? Like the above pricing analysis, answers vary based on the survey subsegments of users versus non-users.

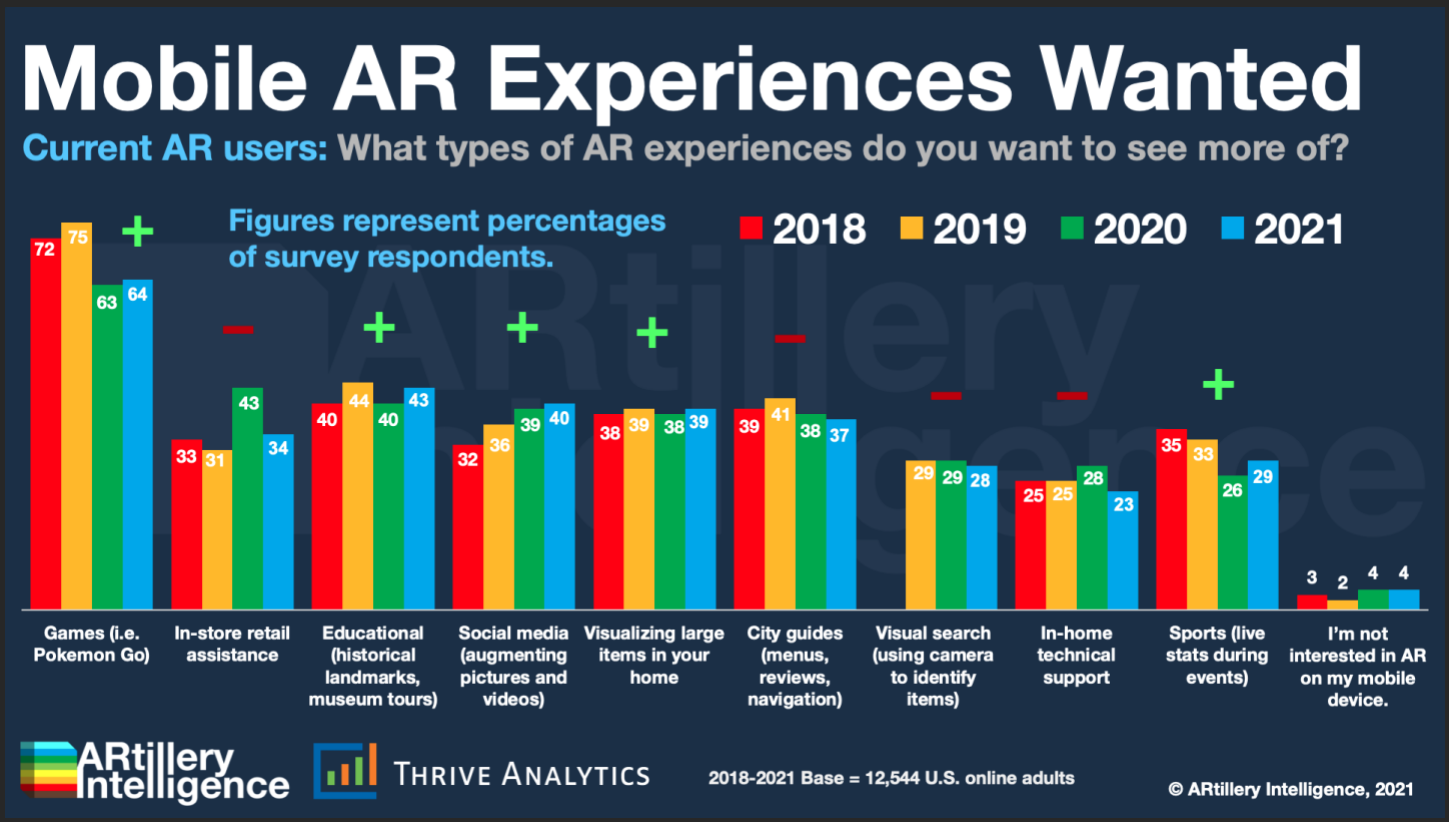
For current AR users, gaming leads among aspirational use cases (**64 percent**). That's followed by education (**43 percent**) social (**40 percent**) product visualization (**39 percent**), city guides (**37 percent**), sports (**29 percent**), and in-home tech support (**23 percent**).

Extracting insights from these figures and their year-over-year trending, two things jump out at us: **1.** The drop in interest in Wave IV for in-store AR shopping; and **2.** The jump in interest for education, gaming, social, product visualization, and sports content.

Collectively, these AR use cases that performed well in Wave IV align with Covid-era demand signals. In other words, they support sheltered and distanced life in various ways.

Conversely, AR in-store experiences were previously on an upswing, growing significantly from Wave II to Wave III, as shown below. But they then fell significantly in Wave IV as in-store retail shopping itself receded. AR interest correspondingly shifted to remote use cases such as product visualization, social interaction, and sports content, as noted.

We expect consumers' use and interest in AR retail shopping to rebound eventually, along with other physical-world AR use cases like local discovery and visual search. Meanwhile, these Wave IV results reflect consumer mindsets and AR aspirations that are a telling "sign of the times."



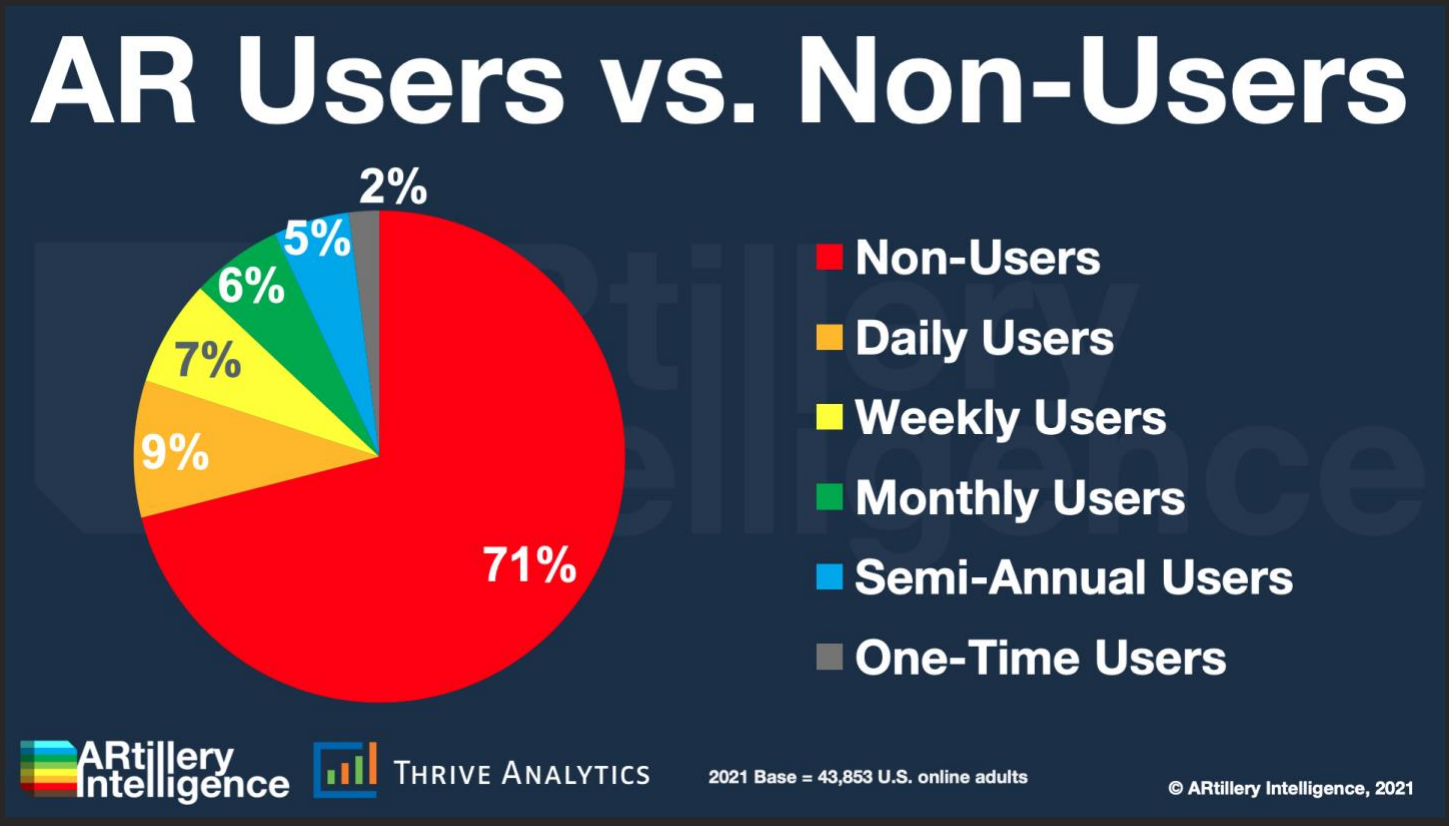
Part II: Non-AR Users

Equally or more important than current AR user sentiments (depending on where you sit) are *non-user* attitudes? Because they're much larger in number at this early stage of AR's adoption curve, appealing to them is a strategic imperative. And that requires knowing what they like and don't like. The following sections examine these *non-user* attitudes.

Mobile AR Penetration

Starting at the top, how do AR *non-users* stack up to users. To back up the above claim that non-users outnumber users, that number currently stands at **71 percent**. That makes AR users correspondingly represent **29 percent** of U.S. adults, as noted earlier.

Like we did in the previous several sections for mobile AR users, we'll drill down into more precise sentiments from this non-user segment, starting with the all-important question of *why*? More accurately, the key question is why they *don't* use AR.



Mobile AR Reasons for Non-Use

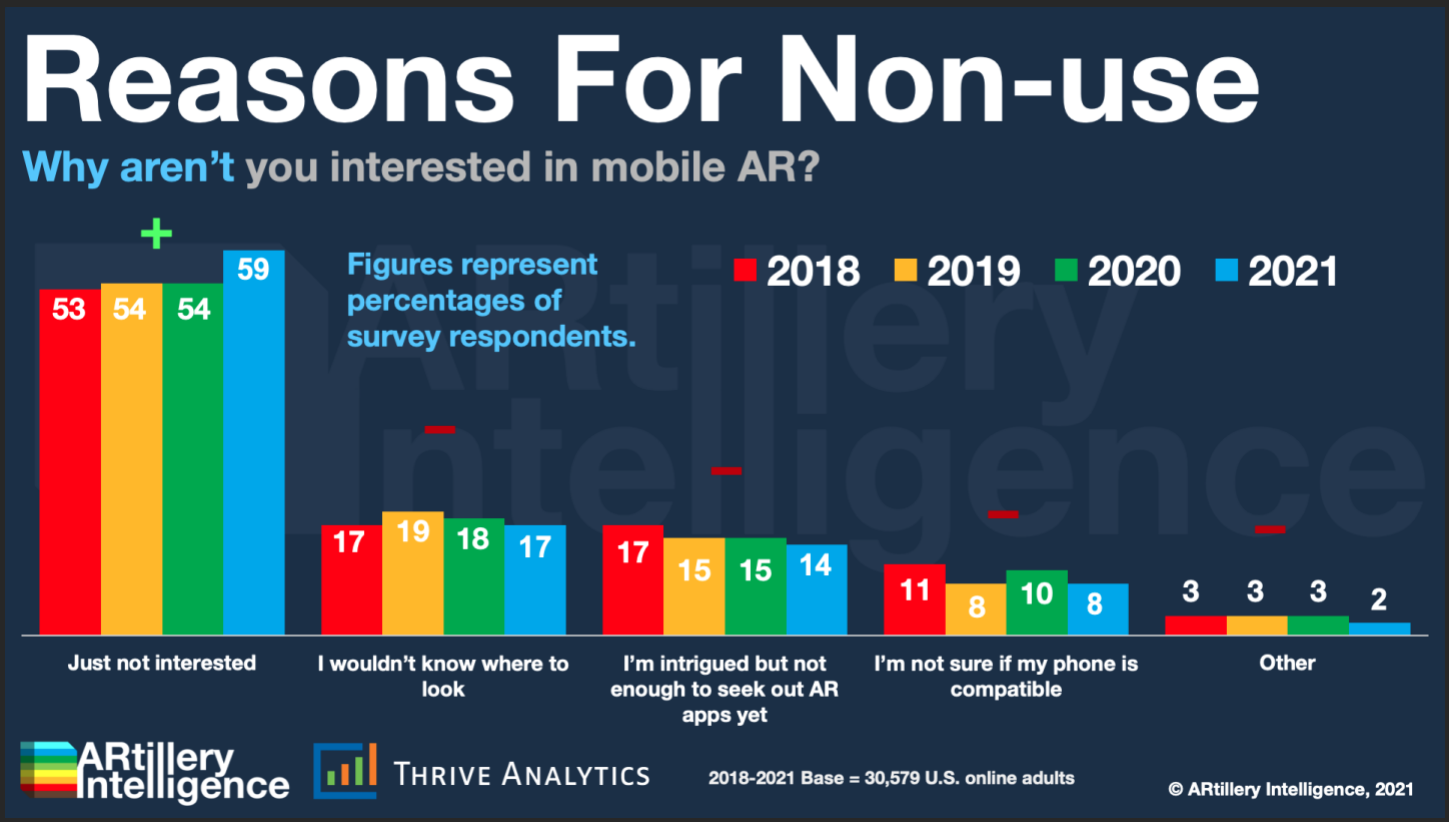
Contrasting AR-user satisfaction levels examined earlier, negative signals from non-users offset those mostly-positive results. Specifically, **59 percent** report that their reason for non-use is *just not interested*. This rather definitive and discouraging sentiment represents a key challenge for AR.

Adding to that, **25 percent** report confusion with mobile AR. That includes *I wouldn't know where to look* (**17 percent**) and *I'm not sure if my phone is compatible* (**8 percent**). Meanwhile, **14 percent** reported interest but not enough to go through the trouble of looking for, and downloading, AR apps.

As for the *just not interested* crowd, they represent the most damning of these non-user responses. This highlights a key "chicken & egg" dilemma for immersive tech. Because it's so visual and visceral, you have to experience it to really understand its value. Without that perspective, there's little motivation to get a first-taste.

In other words, the variance in satisfaction for users and non-users underscores AR's marketing challenge. People love it after they get a taste… but you have to get them to taste it before achieving that point of satisfaction. And with AR, it's difficult to do this through traditional marketing such as ad copy or video.

This will alleviate as mobile AR naturally assimilates into the consumer population through viral and other means. Meanwhile, adoption can be accelerated through gamification and social features that carry the experience to more users via network effect. Experiences delivered without "app friction" – such as web AR and "AR as a Feature" – likewise have greater adoption potential.



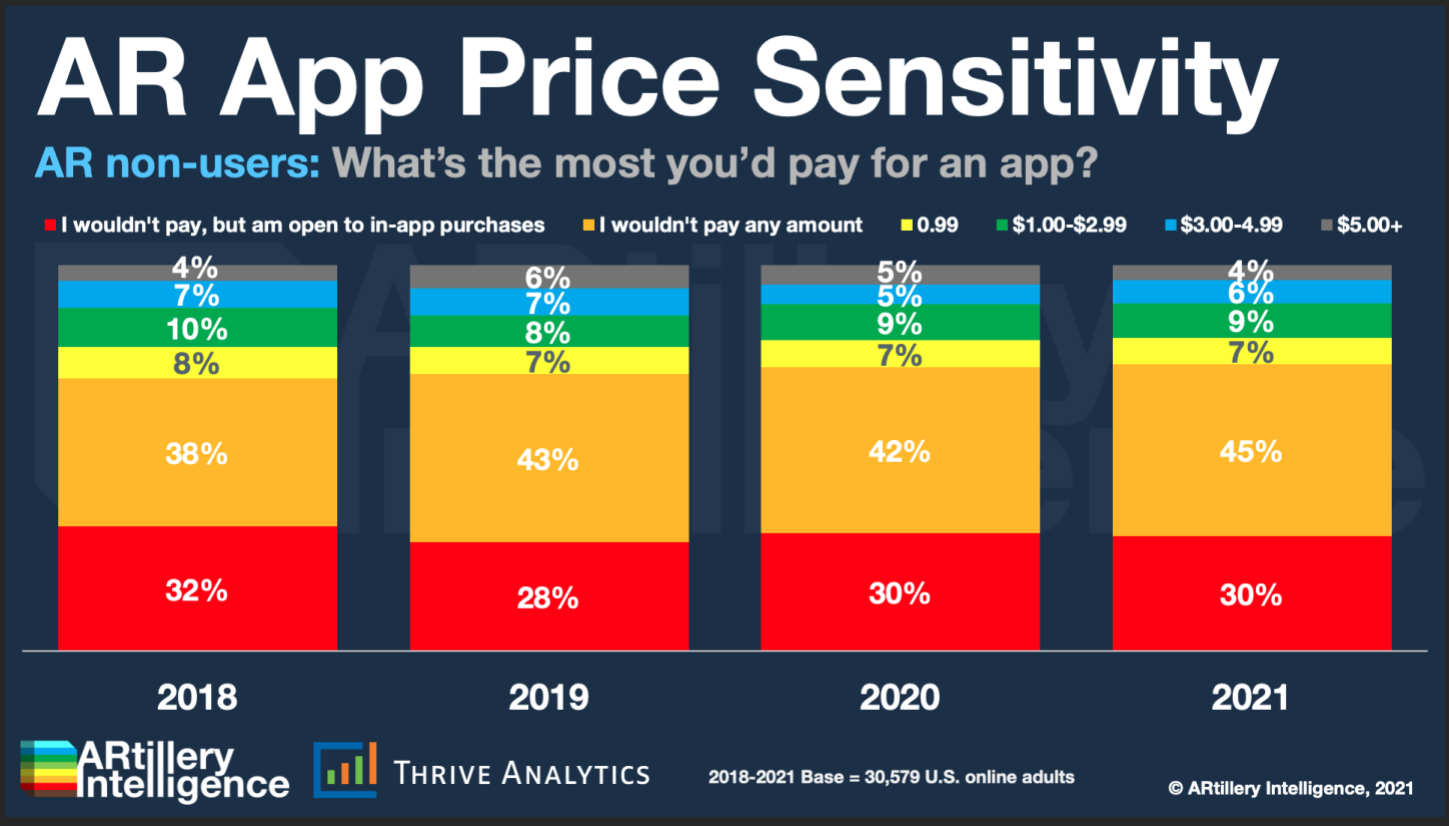
Mobile AR Price Sensitivity

Earlier we examined *AR users'* price sensitivity. Now it's time to perform that same exercise for non-users, whose sentiments vary wildly from users. As a reminder, **63 percent** of users will pay **$1.00** or more for AR apps, and **15 percent** will pay **$5.00** or more. These figures plummet for non-users.

Specifically, **19 percent** of non-users would pay **$1.00** or more, while **4 percent** would pay **$5.00** or more. The disparity between user and non-user sentiments isn't surprising, given that non-users have a self-selected disinterest in AR to begin with (not to mention the sentiments examined on the previous page).

More worrisome is that the greatest share of respondents (**45 percent**) is unwilling to pay *any amount* for mobile AR. These users likely align with the *just not interested* crowd. AR marketing efforts can avoid such users, including specific demographic attributes that **Thrive Analytics** can generate on request.

However, one positive signal from non-users is that **30 percent** would consider in-app purchases after having downloaded a free mobile AR app. Along with current-user responses, this indicates that in-app purchases should be considered to address the largest range of users and affinity groups.



Mobile AR Pricing Strategies

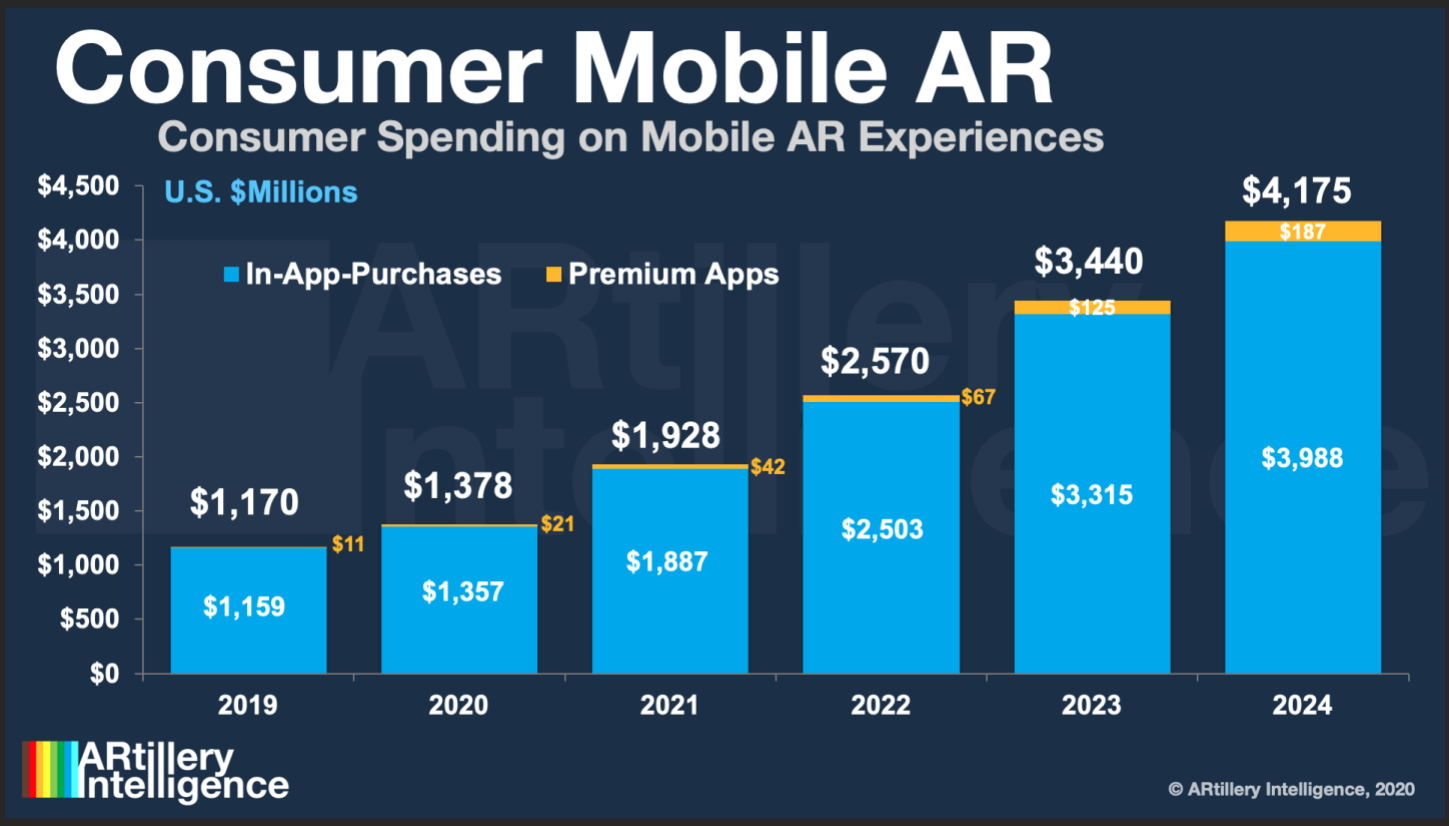
To take another "sidebar" for deeper analysis, the pricing sentiments in this report collectively support in-app purchases (IAP). **14 percent** of AR users and **30 percent** of non-users report that they won't pay upfront for mobile AR apps but will use IAP. This validates several other market signals we've separately examined around the IAP opportunity.[xv]

In short, several signs point to IAP as a prevailing revenue model for mobile AR. Besides the evidence seen in this survey, IAP is a purchase method in which consumers are already comfortable, given its prevalence in mobile gaming. There, it drives **$156 billion** in annual mobile app revenues[xvi]

In AR specifically, IAP likewise signals traction. The AR revenue leader so far is **Pokémon Go** and the majority of its revenue – to the tune of **$4 billion+** [xvii] to date – is through IAP. Given price sensitivity to early/unproven technology, IAP lets users ease into the experience before paying.

In fact, IAP can be advantageous for several reasons. Average revenue per user (ARPU) is often greater than upfront app purchases, due to the behavioral economics of micro-transactions. It also engenders recurring revenue. It depends on the app being developed, but IAP should always be considered as a payment model.

This is especially so in gaming. Conversely, signals indicate that IAP won't be as effective in media, entertainment, and social AR. In these areas, consumers are conditioned to expect subscription or free ad-supported experiences. For example, the latter is how social AR lenses are monetized and is how visual search, a la Google Lens, will monetize.



Mobile AR Non-User Aspirations

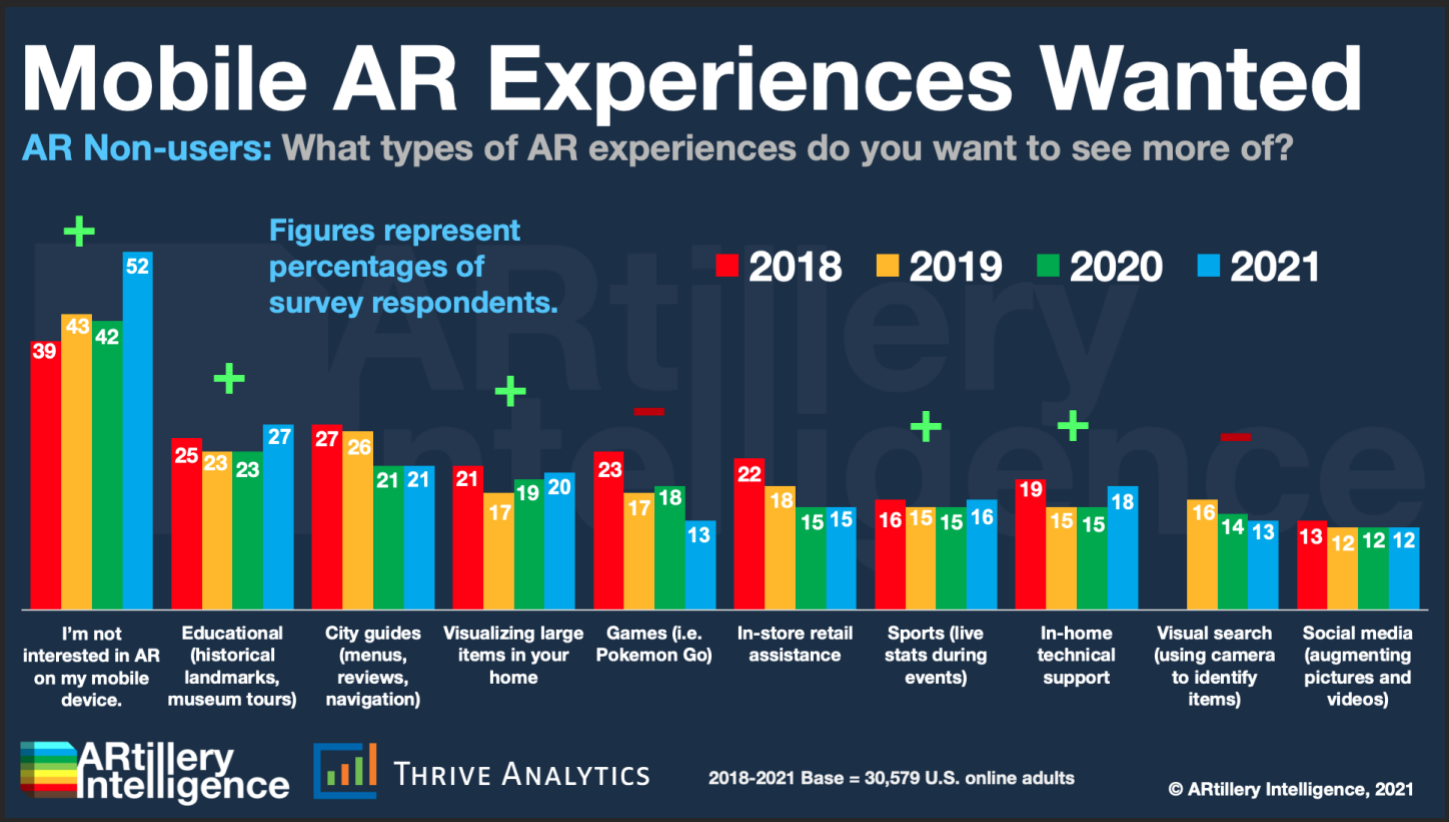
The analysis of non-user sentiments continues... next covering the types of AR experiences they want to see next. This is admittedly a hypothetical exercise because these non-users are essentially reporting the types of experiences they *would be* interested in if they ever converted to AR users.

First, the bad news: **52 percent** aren't interested in any form of AR. This figure grew ten percentage points from Wave III which could be reflective of the Covid-era demand signals examined earlier. Among other categories, educational AR leads (**27 percent**) followed by city guides (**21 percent**) and product visualization (**20 percent**).

One reaction may be to discount these results because these are users who don't engage in mobile AR and are unlikely to, given their sentiments expressed elsewhere in the survey. However, we believe these results are important to consider when developing AR product strategies for *tomorrow*.

In other words, because non-users eclipse users (again **71 percent** versus **29 percent**), they represent a majority of the U.S. adult population. As AR naturally grows over the coming years, these non-users could represent future converts. So their sentiments matter in "skating to where the puck is going."

Furthermore, non-users represent different psychographics than users. The latter are typically early adopters, gamers, social mavens and overall tech-savvy individuals. Non-users conversely represent the mainstream, so long-term AR product strategies should take their sentiments to heart.



Mobile AR Adoption Likelihood

Finally, in the same “aspirational” vein, we asked non-AR users about the likelihood of being swayed by mobile AR in the next 12 months. The majority of respondents (**63 percent**) report that they’re unlikely or extremely unlikely to adopt. **13 percent** expressed likelihood or extreme likelihood.

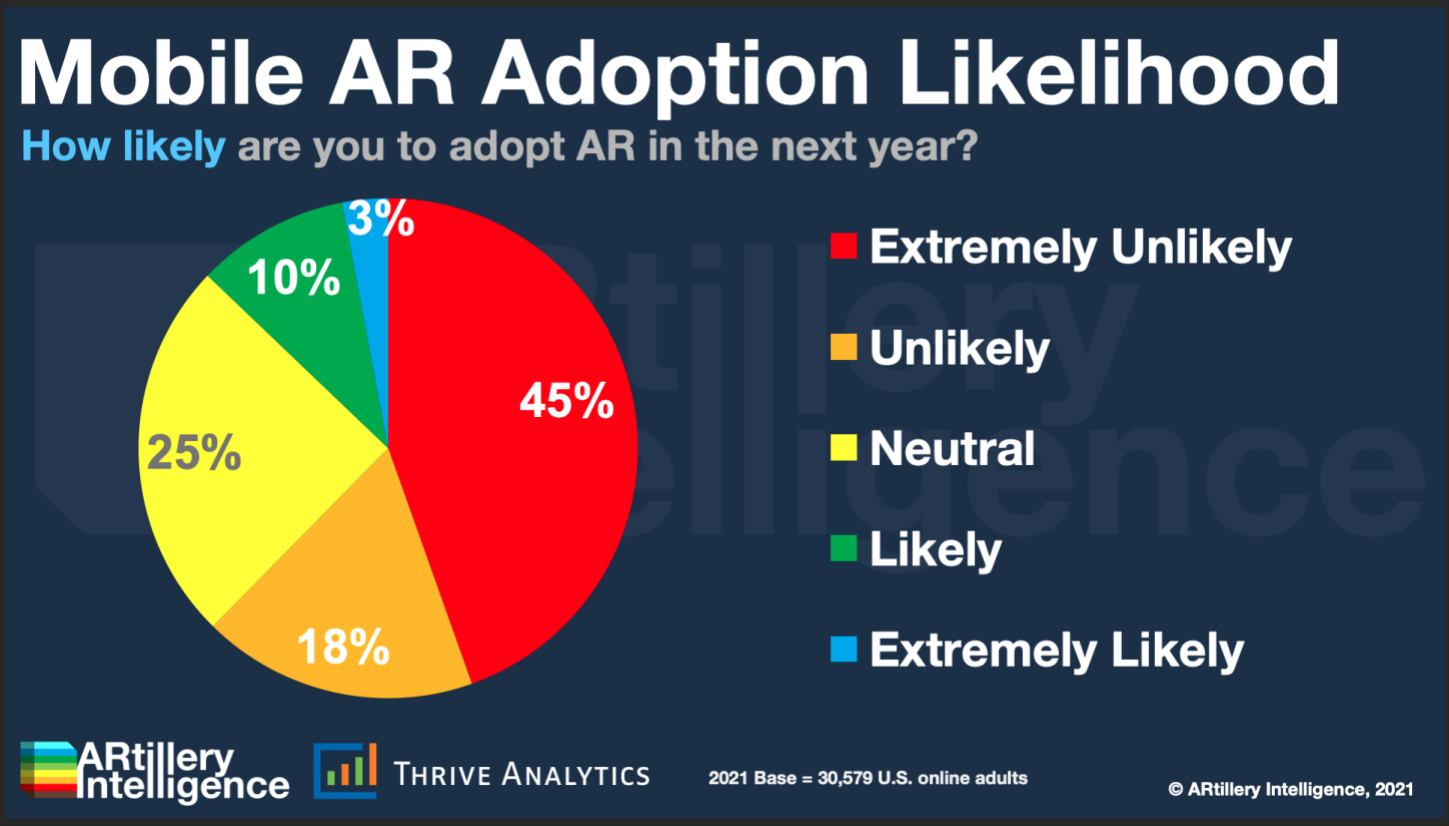
Though these forward-looking sentiments aren’t surprising for self-selected non-users (and they align with many of the non-user sentiments examined in the previous pages), they are still discouraging. However, there is hope in appealing to these users as AR evolves as a product

In addition to product evolution, AR’s cultural assimilation will cause more non-users to warm up to it. This could take a while to play out, as is often the case with emerging tech.

Meanwhile, there are actions and strategies to grow AR usage among users and “tough-nut-to-crack” non-users.

Some of these tactics were explored in the previous sections including the application of AR to naturally recurring and frequent use cases like social messaging. Other tactics are examined in the next section, including the need for more consumer education and “plain-spoken” marketing.

Meanwhile, the good news is that we project non-user sentiments to improve over time. History indicates such a common path for new technology acclimation. We’ll be watching closely as that unfolds, including future waves of this survey and perpetual ARtillery Intelligence market-watching.



Part III: Strategic Takeaways

To synthesize the biggest lessons in this report requires examining not just the top-scoring forms of mobile AR, but those that show longevity. On that measure, it's notable that AR-as-a-feature (AR features within non-AR apps) leads AR *formats* for the past three successive survey waves. This signals AR users' affinity for low-friction AR activation.

Drilling down to *categories* of AR experiences, there were sentiments in Wave IV that deviated from previous year-over-year trending. For example, visual search lost considerable mindshare after growing in Wave III. This may be due to Covid-inflicted lockdowns that prevent physical-world visual search experiences to some degree.

We believe that visual search affinity will rebound in Wave V. Not only is its deep-pocketed benefactor (Google) motivated to push the technology to future-proof its core search business, but it also hits all the marks for potential killer apps. Those include high utility and frequency... just like search itself.

We're also bullish on social forms of AR. Given the technology's still-nascent stage, it needs an extra push to get over the classic "chicken & egg" dilemma that we examined earlier in this report. That extra push can come in the form of virality and networking that's infused with social AR experiences.

Another area that shows promise is AR shopping. E-commerce-oriented use cases outperformed retail-based ones in Wave IV, but both modalities will have a strong future in the post-Covid world. They not only appeal to consumers as shopping utilities but represent inherently-monetizable AR experiences that retailers and brands continue to flock to.[xviii]

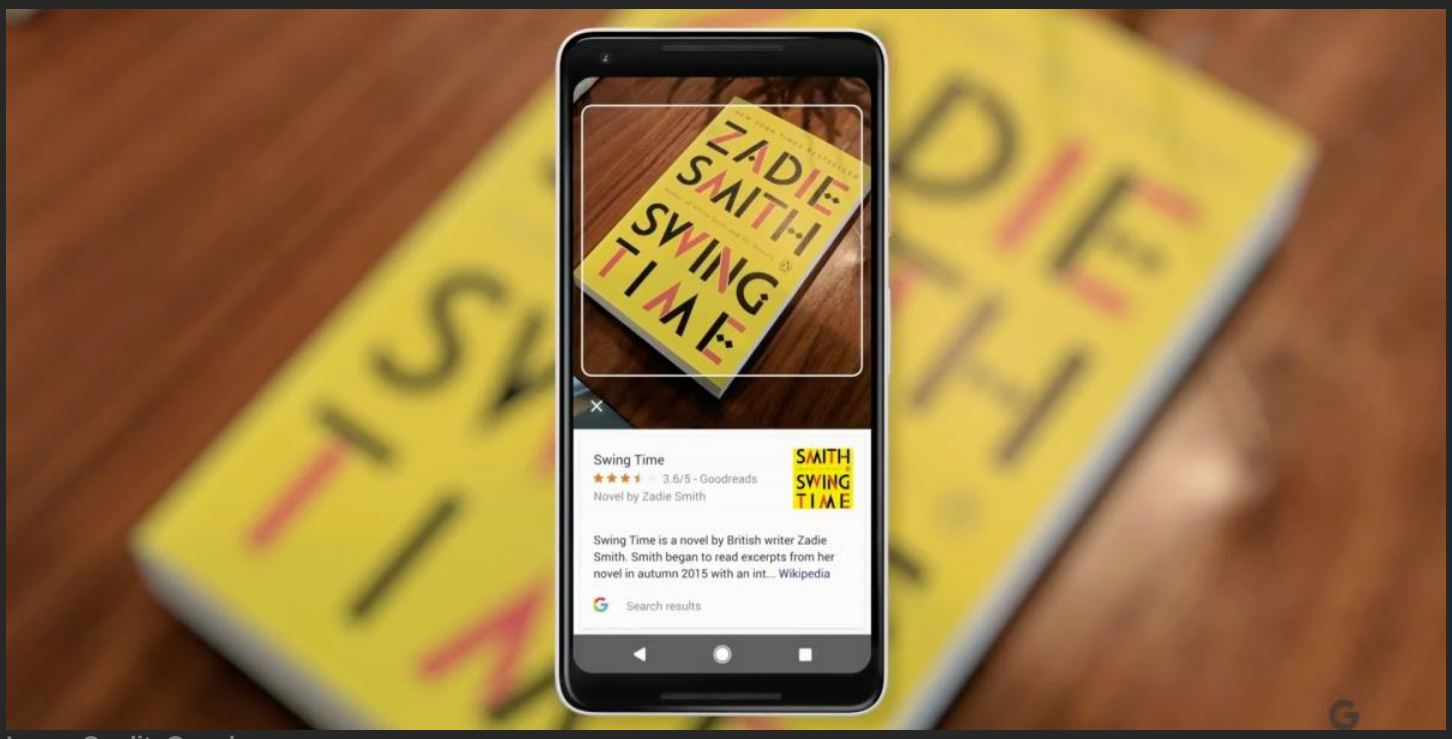


Image Credit: Google

Mixed Results

Though the areas explored on the previous page represent mobile AR's bright spots, there are likewise areas for improvement. These are most evident in the ambivalent sentiments expressed by non-AR users in this survey. But there is still hope in actions and strategies to win them over in the coming years.

First and foremost is *education*. If we go back to the *Reasons for Non-Use* results, some of the sentiments represent user groups that could be attainable as AR converts. Setting aside the *just not interested* crowd as a possible lost cause, the "*wouldn't know where to look*" respondents can be addressed.

In other words, their responses signal the need for better consumer education. The AR industry, though innovative, has been accused of being stuck in its own "bubble," while lacking effectiveness in consumer marketing. Correspondingly, one area of improvement for the AR industry to eschew tech jargon and collectively work on plain-spoken messaging.

For example, mainstream consumers get turned off by the alphabet soup that normally characterizes new technologies. Notice how the most successful forms of AR – **Pokémon Go** and **Snapchat lenses** – never use the term "AR". Google Lens likewise uses the term "search what you see" to market Google Lens.

The bottom line is that AR remains in "techy" territory in terms of confusion and other factors that compel better education and marketing.

Image Credit: Snap

History Repeats

When examining all of the “flavors” of mobile AR examined in this report, a pattern emerges. We see similar killer apps and prevalent use cases that emerged in previous tech waves. With the desktop web and smartphones, it was search, commerce, and social media that rose to prominence as frequent use cases.

AR will follow the same patterns – and some of its own – as these use cases tap into universal human needs that aren’t going away. They include the need to have information at our fingertips (visual search), connect with other people (social AR), and assist in finding and discovering products (AR commerce).

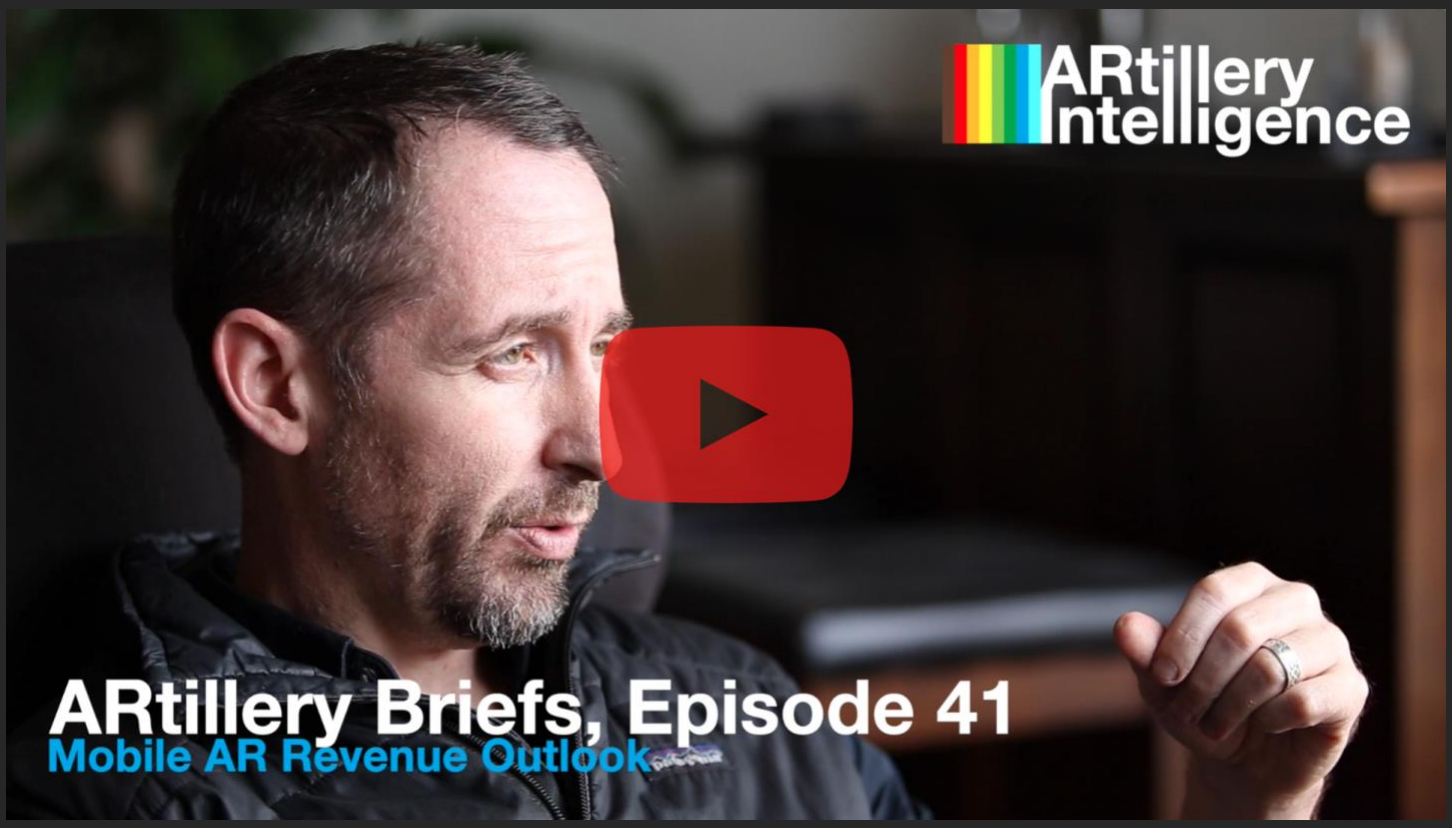
Not only do these use cases tap into universal needs, they’re also endpoints that consumers are *comfortable with*. Just as we asserted in our recent report series on lessons from AR leaders,[xix] AR will find its own unique areas to shine. But until then, success is most often found when it builds on the *familiar*.

We’ll be back next year in Wave V – and several monthly narrative and data reports until then – to continue tracking the evolution of consumer AR behavior and attitudes. Extending from that, our commitment is to trace that evolving behavior back to its strategic signals for business opportunity.

Image Credit: Apple

Video Companion

Click to Play



ARtillery Intelligence

Key Takeaways

- **Among Wave IV survey respondents 29% have actively experienced mobile AR at least once.**
- This represents healthy adoption, but also substantial headroom to grow in the coming years.
- We expect adoption to accelerate in future survey waves, similar to early smartphone adoption.
- This year's results were impacted by Covid-19 positively (social, e-commerce) and negatively (visual search).

- **51% have used "AR-as-a-feature," 48% ARCore apps, 43% ARkit apps, and 17% web AR.**
- AR-as-a-feature (AR within non-AR apps) holds a leading position by a narrow margin for the third year.
- Practiced by top AR apps like Snapchat and Pokémon Go, ARaaF is validated in real-world success.
- Though apps have an early lead, web AR's advantages could vault it forward in the coming years.

- **78% of mobile AR users are active at least monthly. 59% are active weekly or greater.**
- These frequency ratings are up considerably from Wave III, reflecting AR's ongoing cultural assimilation.
- Frequency growth can also be attributed to Covid-era demand signals for quarantine-friendly AR lenses.
- In that sense, AR piggybacks on applicable Covid-advantaged sectors like gaming, social and e-commerce.
- Otherwise, mobile AR that fuses novelty with frequency (e.g., social messaging) can achieve high active use.

- **Games lead mobile AR use (86%), followed by social (41%) and product visualization (34%).**
- Gaming's leading position is largely attributed to Pokémon Go, which continues to thrive as a mobile game.
- Social app success can result from sticky/frequent behavior, viral growth, and network effect.
- Product visualization can save users time and money through more-informed e-commerce transactions.

- **Mobile AR users want more games (64%), education (43%), social (40%), and shopping (39%).**
- In-store retail AR experiences dropped out of the top-five aspirational use cases in Wave IV.
- Interest instead shifted to Covid-aligned use cases such as product visualization for e-commerce.
- We believe that physical-world-oriented AR use cases (retail, visual search), will rebound in Wave V.

- **75% of mobile AR users are either satisfied (45%) or very satisfied (30%) with their experiences.**
- Like the above frequency metric, these high satisfaction ratings are up considerably from Wave III.
- This could be due to AR product evolution, cultural assimilation, and alignment with Covid-19 dynamics.

- **The bad news: 54% of non-mobile AR users report definitive disinterest, and 28% report confusion.**
- Stark variance between user and non-user attitudes underscores AR's "chicken & egg" dilemma.
- Because it's so visual and visceral, users have to first experience AR to realize its benefits.
- Yet without that experience and perspective, there's little motivation to get a first-taste.
- Compounding these challenges, AR's immersive qualities can't be captured in ad copy or video.

- **63% of mobile AR users will pay $1.00 or more for apps. 15% will pay $5.00 or more.**
- This compares with 19% of non-users who will pay $1.00 or more for apps. 45% won't pay any amount.
- Price sensitivity underscores another stark variance in attitudes between users and non-users.

- **In-app purchases (IAP) showed strong acceptance among users (14%) and non-users (30%).**
- IAP should always be considered as it addresses the largest range of interests.
- Pokémon Go has made $4 billion+ to date through IAP, inheriting an established model from mobile gaming.
- Revenue per user is often greater with IAP due to the behavioral economics of microtransactions.

- **AR's wider-scale adoption will require consumer education, assimilation and at least one "killer app."**
- There's not enough of an adoption impetus yet for mainstream consumers to flock to AR en-masse.
- Broad AR appeal and high-frequency could result from valuable "all-day" utilities such as visual search.

About ARtillery Intelligence

ARtillery Intelligence chronicles the evolution of spatial computing. Through writings and multimedia, it provides deep and analytical views into the industry's biggest players, opportunities and strategies.

Run by analysts and former journalists, coverage is grounded in a disciplined and journalistic approach. It also maintains a business angle: Though there are lots of fun and games in spatial computing, cultural, technological and financial implications are the primary focus.

Products include the **AR Insider** publication and the **ARtillery PRO** research subscription, which together engender a circular flow of knowledge. Research includes monthly narrative reports, market-sizing forecasts consumer survey data and multi-media, all housed in a robust intelligence vault.

Learn more **here**.

About Thrive Analytics

Thrive Analytics is a leading digital marketing research and customer engagement consulting firm. With clients spanning leading national brands as well as publishers and agencies serving the small business community, it pairs proprietary market research services and data analytical tools with time-tested business insights and methodologies to help organizations measurably improve customer experience, loyalty and sales. Its mission is to provide superior research and support services that inspire clients to make smarter decisions. For more information or to contact, visit **here**.

About Virtual Reality Monitor

Virtual Reality Monitor™ is Thrive Analytics' proprietary survey of virtual reality/augmented reality technology users. These surveys, conducted semiannually, track the adoption rates, usage, satisfaction levels, profiles and many other areas related to VR/AR users. Each wave has a customizable section for client specific inquiries. Results & key insights are communicated in advisory reports & presentations, charts & infographics, newsletters & articles and custom data views. Information from these studies is used by marketers, product managers, consultants and other people working in the technology space.

About Intelligence Briefings

ARtillery Intelligence Briefings are monthly installments of spatial computing analysis. They synthesize original data to reveal opportunities and dynamics of spatial computing sectors. A layer of insights is applied to translate market events and raw figures into prescriptive advice.

More information, past reports and editorial calendar can be seen **here.**

About the Author

Mike Boland was one of Silicon Valley's first tech reporters of the Internet age, as a staff reporter for *Forbes* (print) starting in 2000. He has been an industry analyst covering mobile and social media since 2005 and is now Chief Analyst of ARtillery Intelligence and Editor-in-Chief of *AR Insider.*

Mike is a frequent speaker at industry conferences such as AWE, VRLA and XRDC. He has authored more than 120 reports and market-sizing forecasts on the tech & media landscape. He contributes regularly to news sources such as *TechCrunch*, *Business Insider* and the *Huffington Post*.

A trusted source for tech journalists, his comments have appeared in A-list publications, including *The New Yorker*, *The Wall Street Journal* and *The New York Times*.

Further background, history and credentials can be read **here.**

Methodology

ARtillery Intelligence has partnered with Thrive Analytics by writing the questions for the Virtual Reality Monitor consumer survey. These questions were fielded to more than 43,000 U.S. Adults. ARtillery Intelligence wrote this report, containing its insights and viewpoints on the survey results.

For market sizing and analysis, ARtillery Intelligence follows disciplined best practices, developed and reinforced through its principles' 15 years in research and intelligence in the tech sector. This includes the past 5 years covering AR & VR exclusively, as seen in research reports and daily reporting.

Thrive Analytics likewise follows best practices in consumer research, developed over its long tenure as a consumer research firm. More details about the survey sample can be seen in this report's introduction and more on ARtillery Intelligence research and methodology can be read **here.**

Disclosure and Ethics Policy

ARtillery Intelligence has no financial stake in the companies mentioned in this report, nor was it commissioned to produce it. With respect to market sizing, ARtillery Intelligence remains independent of players and practitioners in the sectors it covers, thus mitigating bias in industry revenue calculations and projections.

ARtillery Intelligence's disclosure and ethics policy can be seen in full **here.**

Contact

Questions and requests for deeper analysis can be submitted **here.**

Reference

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[i] ARtillery Intelligence Report, **Mobile AR Revenue Forecast, 2019-2024** (sign-in required)
[ii] ARtillery Intelligence Report, **AR Advertising Deep Dive, Part I: The Landscape** (sign-in required)
[iii] ARtillery Intelligence Report, **Lessons from AR Leaders, Part III** (sign-in required)
[iv] ARtillery Intelligence Report, **Lessons from AR Leaders, Part II** (sign-in required)
[v] ARtillery Intelligence Article, **Pokémon Go's Reaches $4 Billion Lifetime Revs** (sign-in required)
[vi] ARtillery Intelligence Article, **Snap Q4 Earnings, the AR Angle** (sign-in required)
[vii] ARtillery Intelligence Report, **AR Advertising Deep Dive, Part I: The Landscape** (sign-in required)
[viii] ARtillery Intelligence Report, **Mobile AR Revenue Forecast, 2019-2024** (sign-in required)
[ix] ARtillery Intelligence Article, **Follow the Money for AR Trajectory** (sign-in required)
[x] ARtillery Intelligence Article, **Google Lens Recognizes 15 Billion Products** (sign-in required)
[xi] ARtillery Intelligence Report, **VR Usage & Consumer Attitudes, Wave IV** (sign-in required)
[xii] Localytics Report, **Mobile App Retention Data**
[xiii] ARtillery Intelligence Report, **Lessons from AR Leaders, Part III** (sign-in required)
[xiv] ARtillery Intelligence Article, **Pokémon Go's Reaches $4 Billion Lifetime Revs** (sign-in required)
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[xix] ARtillery Intelligence Report, **Lessons from AR Leaders, Part III** (sign-in required)